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Washington Highlights

California's petition for a survey of all its coast as a means of determining State and Federal boundary lines in the tidelands oil controversy has awakened Government opposition.

The Supreme Court has been asked by California to appoint a master in chancery to decide such a boundary along the entire coast.

Several weeks ago the Government requested the court to rule that three areas—San Pedro and Newport Bays and Santa Barbara Channel—be put under Federal control. The Justice Department holds that these areas come under the court's decision ruling that marginal seas belong to the Government.

A Senate judiciary subcommittee, meanwhile, voted to approve a bill giving States clear-cut title to coastal tidelands. The bill followed four weeks of hearings. It must be approved by the full Senate judiciary committee before going to the Senate floor.

Under the terms of the measure, approved by the subcommittee, States would be given ownership of submerged coastal lands between the mean low tide and three miles from shore. A bill drawn along similar lines was vetoed by President Truman in 1946.

Provisions of a bill passed by the Senate call for keeping the synthetic rubber industry under Federal controls until June 30, 1950. Senator Bricker, Republican, of Ohio, said the industry is agreed on the bill. The bill now goes back to the House.

Latin-American countries have been asked by the United States to explore for more petroleum in view of the rapid increase in demand for oil products in all quarters of the globe. The request was made in the form of a State Department memorandum distributed to the 20 Latin-American nations through the medium of the Inter-American Economic and Social Council.

A report to the Securities and Exchange Commission disclosed that Trans-Arabian Pipe Line Co. has drawn an additional $35,000,000 against the $125,000,000 credit it arranged in 1947 with insurance companies. Trans-Arabian is jointly owned by Standard of California and Texas Co. The arrangement will be widened to take in Standard of New Jersey and Socony-Vacuum Oil Co., Inc., when present legal problems are solved.

The Interior Department's liquid fuels demonstration plant at Rifle, Colo., has been turning out 50 barrels of shale oil daily since last May. It is using a rich shale which gives up about 30 gallons of oil to the ton. In order to extract the oil, the shale must be crushed and heated. Comparable methods yield a usable grade of Diesel fuel of low octane value. Extensive research is still needed on refining processes for shale, according to Government fuel men.

Twenty-seven per cent more oil burners were in use in California during last year than in 1946, Goverment figures indicated. One reason for the jump in the number of oil burners in the state is due to new houses specifying oil heating systems. Industrial firms on the Pacific Coast more and more are turning to Diesel engines for power.

Headquarters here of the Independent Petroleum Association of America have revealed that at the mid-year meeting of the organization's directors at Wichita, Kans., April 26-27, the present high demand for petroleum products will be reviewed.

The reflection of this demand on the domestic oil industry during the coming months will be studied thoroughly.

Economic and technical aspects of the domestic industry will be important items for discussions, particularly as to recovery of oil from semi-depleted oil fields by means of renewing exhausted formation pressures.

"National oil policy," association president Merle Becker recently declared, "must incorporate such planning as to accomplish two purposes. The first of these is to assure a continuance of an adequate supply of crude oil. The second purpose must be toward maintaining a sound and progressive industry that can meet either normal or emergency needs in the future."

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Tests show that Kobe torch-cut slots in screen casing hold back the sand and permit better drainage of the pay zone.

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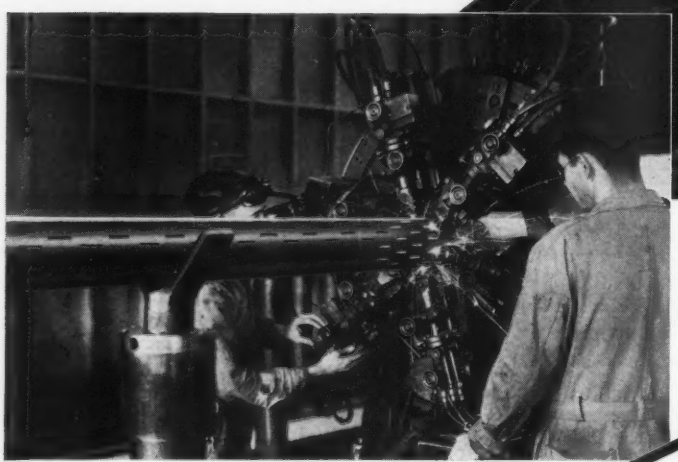

Slotting screen casing with Kobe's oxy-acetylene machine that heat treats as it cuts.

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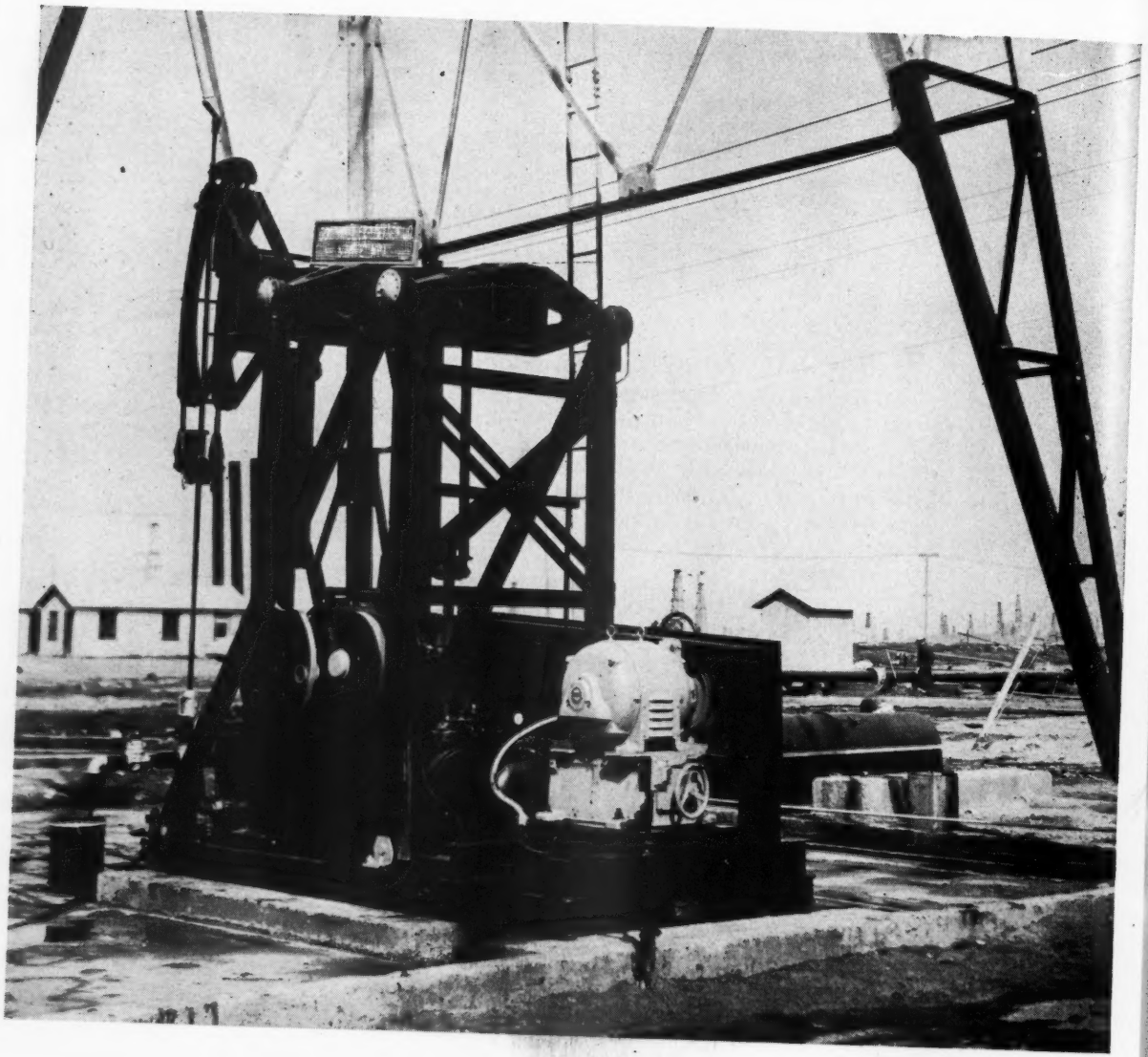
Production Review

In the first lush days of the industry, the driller merely brought in the well and turned it over to the production department. Thereafter, there was little to be done but to gauge the daily output in the rundown tanks, and give the moving equipment an occasional shot of oil or grease to keep it performing with the minimum of distress. There were records to be prepared, of course, but even the accounting business was then a comparatively simple process. Vendors and lessors, believe it or not, were rather naive individuals, who were not too greatly concerned with the manner of settlement, so long as the amount was sufficiently attractive. As might be expected, that situation did not long prevail. As the public relationists tell us, "oil is progressive," and when competition began to grow a little keener, and the system of free enterprise gradually asserted itself, operators were obliged to economize and to look ahead, so that they could rationally bid for today's business, and at the same time assure themselves of future supply.

This had the effect of injecting into the production picture two new individuals—the economist and the scientist. Not infrequently they were one and the same person, and we have at the present time in the California petroleum industry some tremendously capable scientific or mathematical analysts. It doesn't matter much what we call them, but the reference is to men like R. L. Minckler and Marion Dice of the General Petroleum Corporation; Graham Moody of Standard Oil Company, and Stanley Wimpress of Union Oil Company, and many others who have developed in a remarkable way the faculty of analysing trends and predicting future needs. These men do not engage in cold mathematical projections. They are familiar not only with the changing supply and demand situation, but they are also familiar with methods of production and refining. They watch the research barometer, so they know what the prevalent developments in technique and equipment are, and how they are likely to affect the industrial future. They are not simply foretelling for the privilege of someday saying, "I told you so." The fact is that men of this type are the pilots of business. So logically and rationally are their conclusions derived that they are actually used to chart the forward course of industrial behavior.

Getting back to the production scientists, however, it must at once be conceded that their introduction into the field has had a salutary effect on all phases of petroleum recovery. They have improved existing techniques, devised new ones, and in many and devious ways have slowly but surely removed from the producing processes all perceivable elements of chance and have lifted them to higher planes of exactitude. In effect, the function of the petroleum engineer and his scientific aides is to capture the highest possible proportion of oil from the reservoir, once the oil sand has been tapped. It has been estimated that in some of the earliest oilfields discovered in the United States, only ten to twenty per cent of the available oil was actually recovered, while today, by virtue of greater understanding and improved techniques, it is expected that the ultimate recovery in some fields will

Here operators are running a pressure bomb into a well for the purpose of determining bottom hole pressure. The bomb contains an element that expands as the pressure increases. The pressure data are useful in many production problems.



Consider electric equipment . . . cost-wise!

When considering expansion or new development, many operators are profiting from a thorough investigation into the uses of electric power. Besides its many operational advantages—compactness, lighter weight, reduced fire hazard, unexcelled dependability—electrically-driven equipment is a wise choice considered strictly from a financial standpoint. The low initial cost of the equipment itself is reflected throughout the financial statement, in lower taxes, lower interest, insurance and depreciation charges.

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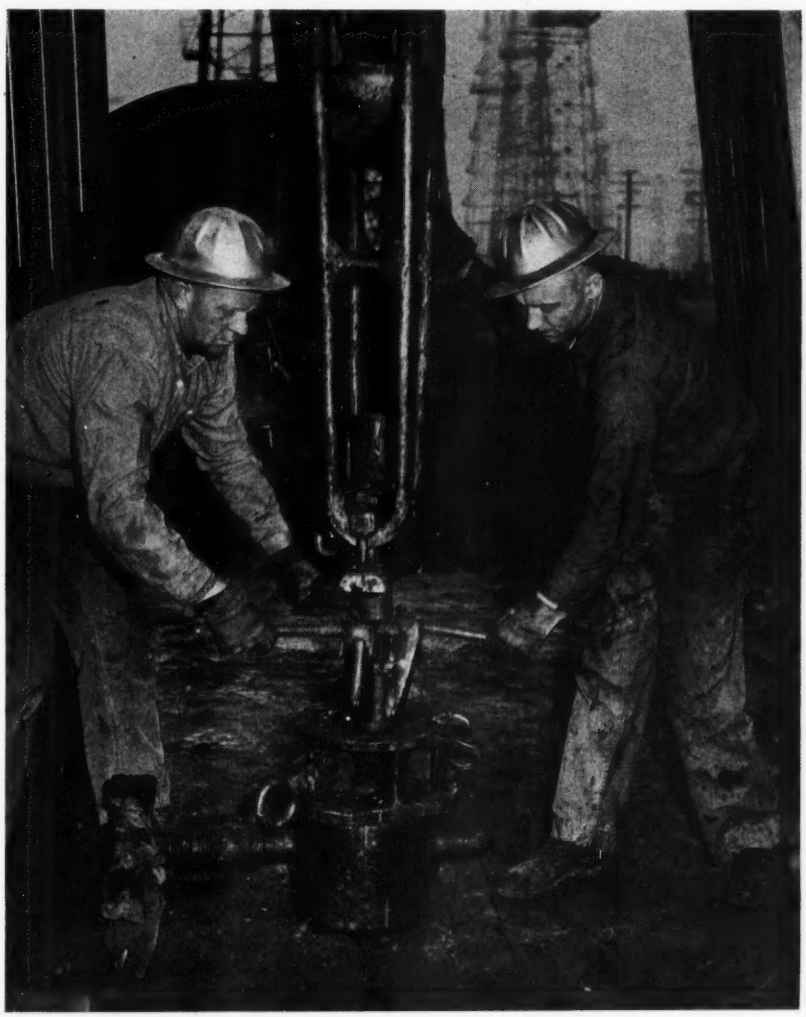
approximate seventy-five per cent.

It seems fair to assume that this advance may be largely attributed to the increasing knowledge of subsurface conditions and their significance. The development of instruments, devices, and methods, for determining porosity, permeability, bottom hole pressure, and other pertinent factors, has aided greatly in directing the approach of the production department. We even have a group of abstruse mathematical physicists now who are forcing into the light essential data relating to reservoir behavior. These fellows can calculate what is necessary to contrive the most economical primary recovery from any pool, and what volumes, pressures, etc., might be most effective in a secondary project featuring gas and water drives of many varieties. With all the information that has already been accumulated, the production of oil through the three stages of voluntary flow, artificial lift, and pumping, can be done with greater orderliness and more economy than the pioneer producers believed possible. The establishment of the true function of gas in the mechanics of oil lifting has undoubtedly been responsible for a marked increase in the proportion of available oil recovered, although the precise nature of this increase might not be easy to determine.

Another reason that production techniques have reached a higher level of efficiency is that well completions are now vastly more effective than they have ever been before. Cementing jobs are carried on with a precision, and with a coincidental speed, that a few years ago were quite beyond reach. It is now not only possible to place the slurry accurately where it is wanted but, because of better hole surveys, to introduce it in the exact quantity. The result is that wells are turned over to the production department in much better shape, and with a much more reliable picture of the sub-surface conditions. Consequently plug backs, the perforation of successive producing horizons, and remedial work of many types can be carried on with a degree of understanding that could not be achieved when less effective implements and processes were employed. Indicative of the elasticity of prevailing methods is the squeeze cementing process that is now being used very effectively, sometimes in conjunction with selective gun perforation. This has been used extensively for shutting off water and gas without limiting the oil flow. Interesting tools have been invented for performing several cement jobs at different levels without removing the equipment from the hole between shots, and cementing in general is now so expertly done that one would be justified in believing that the operator actually sees what goes on ten thousand feet below ground. The gun perforator also has a multitude of functions in these modern days, and its efficacy is being extended daily through constant study of the gun itself, the explosives used, the shape of the projectile, and the material of which it is made.

It can be well imagined that as the average depth of the completed wells has increased, so correspondingly have the problems to be faced by the production engineers. This has been especially evident in the matter of pumping. It is obvious, for example, that directional holes of considerable depth present friction and other difficulties not encountered in shallow, comparatively perpendicular holes. In 1928, it was pretty generally conceded that no plunger pump could lift oil from a greater depth than 5000 feet. Seven or eight years later, however, there had been such an improvement in sucker rods and sucker rod pumps that wells, 8000 feet deep,



Setting slips around tubing being run in a producing well. Visible are the lower part of the traveling block, elevator links, and slips. Remedial work has greatly extended production in many old wells.

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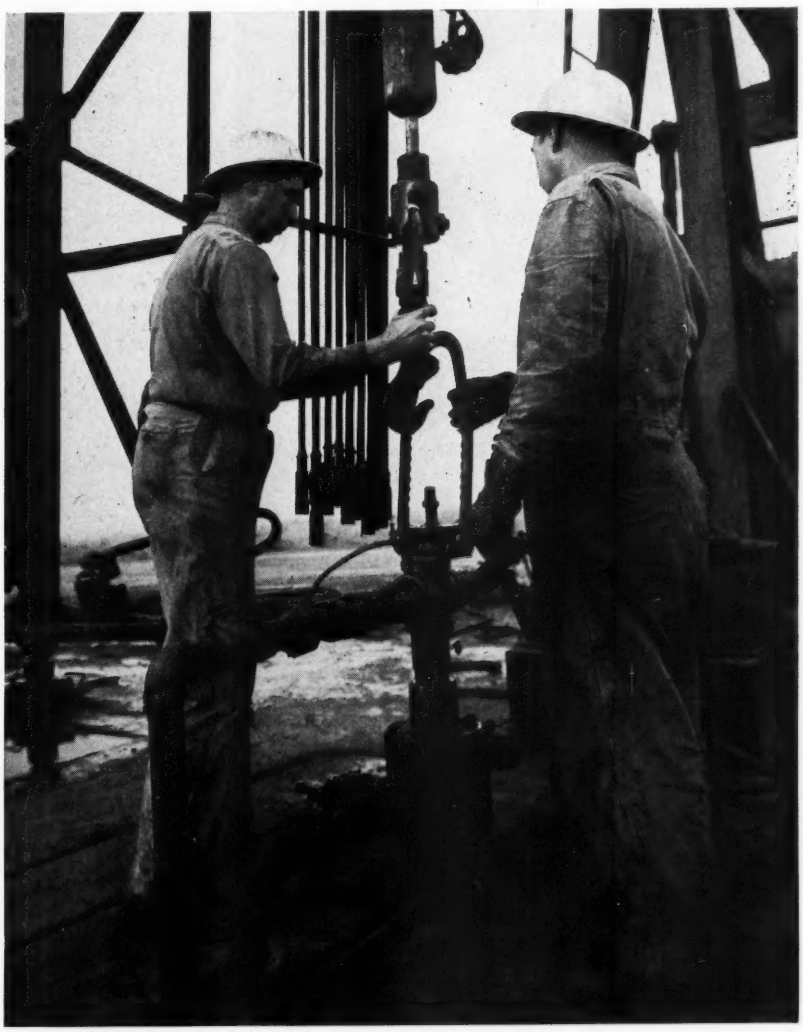
were being economically produced with this type of equipment. In the meantime, the beam pumps have been still further improved and adapted to many different types of usage. Indeed, more and more attention is being paid to the efficiency of all species of pumps, and the conditions under which they are required to operate.

Engineers ordinarily check each unit by a dynamometer test, and so determine its operating characteristics. In this manner many deleterious qualities and effects are eliminated; more satisfactory units for the conditions involved are installed, and new pumps are designed to function more effectively under hitherto unrealized well conditions. The beam pumps have gradually been replaced by individual all-steel reduction-geared units, driven by internal combustion engines or electric motors, either through silent chain, V-belts, or direct shaft and reversible clutch. These quiet units are gradually revamping California's landscape, and are a welcome change from the old one-lunger gas engines that long noisily proclaimed their presence in the older fields.

Also playing an important part in the modern production scheme are various hydraulic pumps. The bottom-hole type is most commonly used and does an excellent job under a diversity of conditions. The latest development in this field is a self-surfacing unit that was widely proclaimed recently. This device, without a cable or other attachment, can be seated in the operating position of the bottom of the hole, or raised to the surface, at will. It promises a distinct saving in well pulling time and general maintenance expense. Another departure in hydraulic pumping that has been attracting considerable attention over the past ten years is the hydraulic rod pump. The virtue of this unit lies in its scarcity of working parts and consequently low upkeep cost, and its elimination of sudden shocks and stresses to the sucker rods.

Worthy of mention in the general program of technical advance is the modern method of prorating production in central gathering systems back to individual wells. This has long been a troublesome process that was greatly facilitated by the development of more accurate flow line meters and adequate sampling devices. The author has many a time gone into a mathematical frenzy in an effort to make some rational distribution of oil in a group gathering plant on the basis of altogether insufficient data. The meters permitted immediate and continuous measurement of individual well production, and built-in samplers provided an opportunity to determine the water content and gravity of the oil, which is all that is required for normal accounting purposes. The production record has also been bettered by improvements in electrical dehydration, demulsifying agents, and the various means of applying them so as to eliminate the bugaboo of stratification. In some instances dehydration may be accomplished right in the flow line, so that the separated water can be bled either before reaching the run-down tanks or just subsequent thereto, thus leaving a dry oil that can be measured and tested with a high degree of accuracy. The more stable emulsions are resolved by the electrical system with the addition of heat, and a demulsifying agent if necessary, right in the field, so reducing both transportation costs and corrosion effects.

The petroleum industry has long been conservation conscious, and many ingenious agencies have been utilized to keep evaporation losses at a minimum. Floating roofs tanks,



Another stage in the removal of a sucker rod from a producing well. In recent years the old beam pumps are gradually being replaced by individual all-steel reduction geared units, and they are certainly giving California fields the new look.

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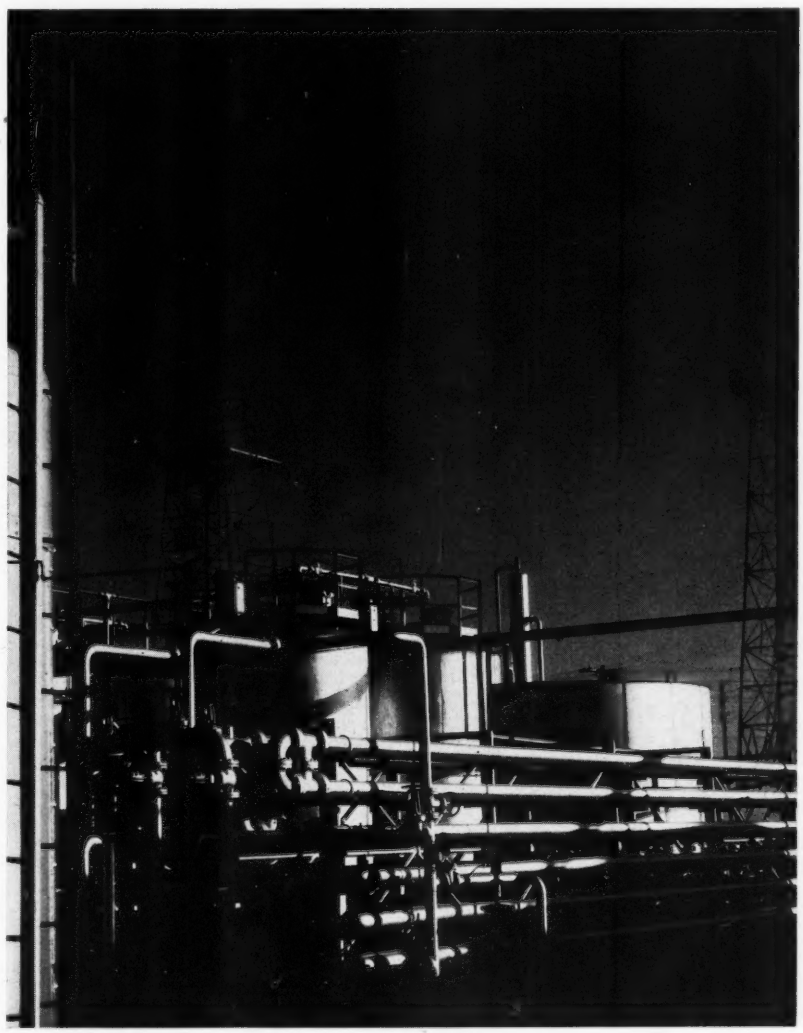
water sealed tanks, pressure tanks, vacuum tanks, vent valves, and a multipilicity of contraptions and gadgets have done yeoman service in this regards, and some very unique ideas have been applied to the simple purpose of keeping the elusive hydrocarbons where they belong, both because they are valuable, and because in the wrong hands they are dangerous. One California company at least utilizes an interesting means of cutting such losses at its storage plants. Exhaust gases from the boilers are passed through a cooling system and thence into the vapor space in large oil containers. These exhaust gases are normally rich in carbon dioxide which is both heavy and inert. It thus serves, first, as a blanket to hold down evaporation to the very minimum, and at the same time is an excellent fire preventive.

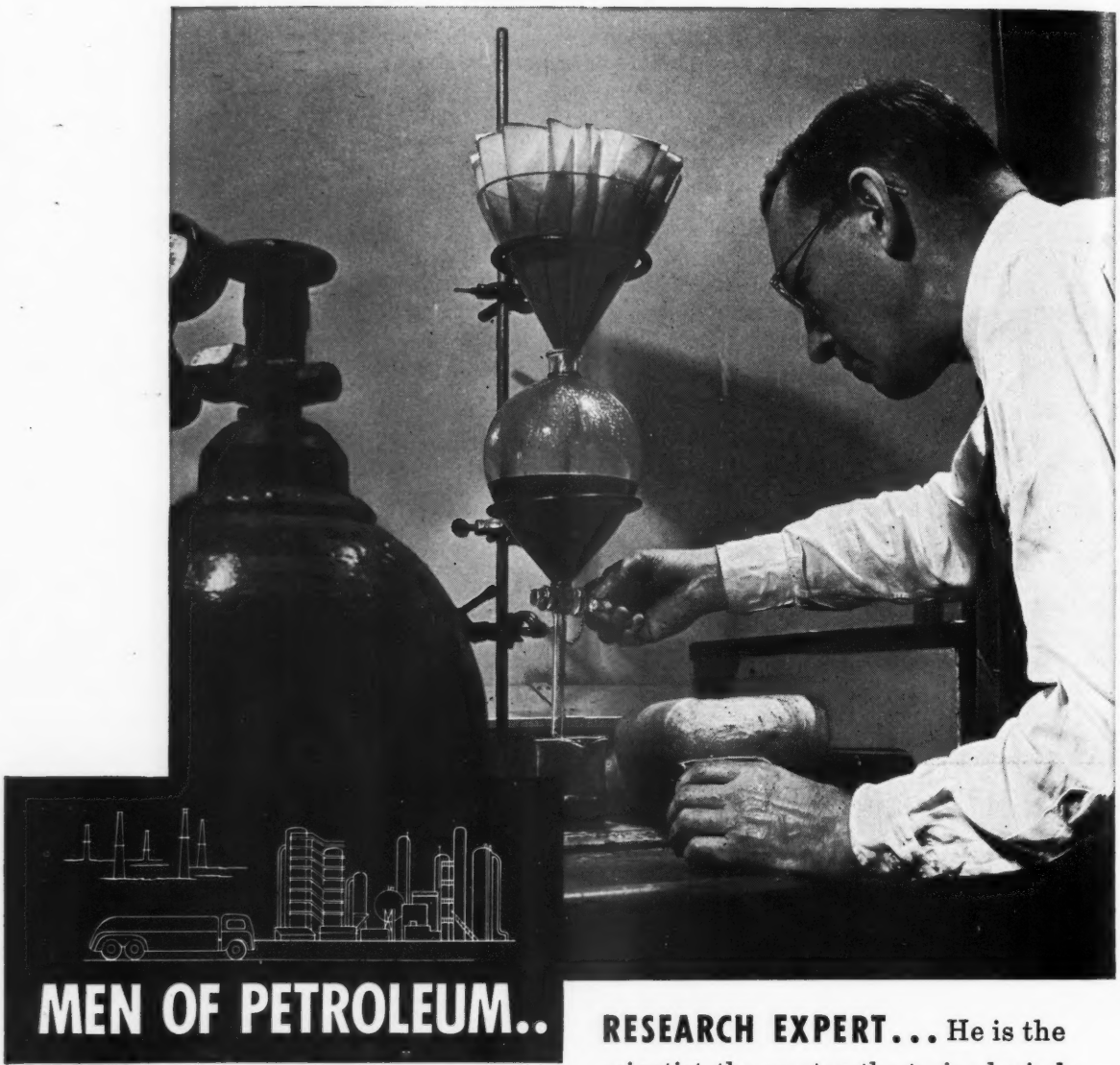
Water in association with oil has always been the bane of the production man's existence. What he calls connate water creeps into the interstices between sand particles as the oil is withdrawn, and if the permeability of the sand is not uniform has a tendency to channel through the most permeable section into the well bore, isolating sizable quantities of what would otherwise be producible oil. Lifting water to the surface is in itself an expensive process, but since in addition well water is normally corrosive, it is patent that any means which can be applied to hold it back until all recoverable oil is in the tanks is worthy of careful consideration. That is why the study of sub-surface conditions goes on **ad infinitum.** The effects of squeeze cementing, formation treatment, mudding off, and other efforts to control water encroachment are so consequential that they simply can't be ignored. With respect to corrosion, some headway has been made against this incorrigible thief by using special alloys wherever possible, and by coating vulnerable equipment with plastics and other anti-corrosives.

Acid treatment of oil formations has been used with a marked degree of success to increase production from wells with dwindling yields, or wells that have failed to produce as sub-surface observations indicated they should. The process, usually carried out by service organizations, because it requires special containers, pumps, and other accessories, is to pump hydrochloric acid through the tubing to the bottom of the well, and thence force it into the permeable parts of the producing horizon. The action of the acid is simply to dissolve away any calcareous or other soluble material that may be interfering with oil flow, and etch new and enlarged channels into the face of the oil sand, thus stimulating a more copious migration into the well. Besides thus increasing the yield of oil, it is now common practice to reduce the flow of water by a sort of reverse process, that is, by using gels of various characteristics to coat the surface of exposed sections. Inhibitors are also largely used to stop the corrosive effect of oil well brines. Readers of California Oil World are familiar with the manner of using plastics in remedial work. Several articles have appeared here on that subject. And it may be readily understood that all of these expedients and the substances involved are subject to constant experimentation and observation, to develop the right routine for each specific condition, and to improve the reagents and methods of application in so far as possible.

There is no exhausting the methods by which the productive capacity of wells may be logically and sometimes quite considerably extended. Aside from the commonly recognized types of secondary recovery, there are many ways in which apparently depleted fields and wells may be brought to life again.



Electric dehydration plants remove emulsified water in the field, thus cutting down transportation costs, and at the same time minimizing the corrosion of equipment and machines with which it normally comes in contact.



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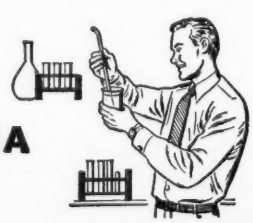


STANDARD OIL COMPANY OF CALIFORNIA

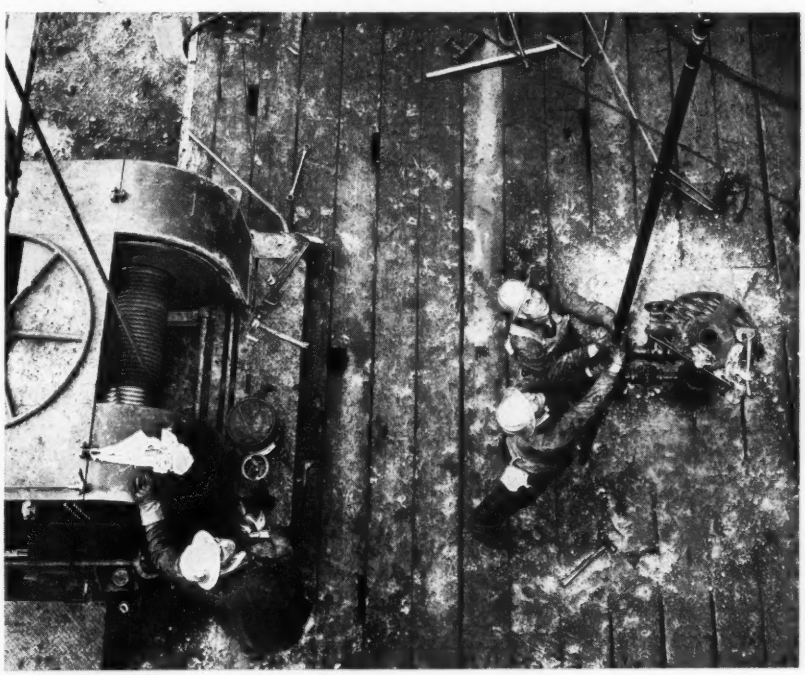
A classic example of this is the work done by Tide Water Associated Oil Company in the Kern River field, under the supervision of George O. Suman. Here an entire field had gone to water and was generally assumed to be pretty well depleted beyond hope of revival. But during the precarious days of the war, a long term study of all the pertinent factors was completed, and an ingenious program for replacing the field on production was launched. The plan was in essence rather simple. It involved the pumping of water from the low structure wells by shaft-driven turbines, at rates in excess of the rates of accumulation. In this manner the water table was dropped down over 150 feet, and one after another the high structure wells came back in, until over 2200 were once more on production.

In recent years there has been a growing interest in secondary recovery, that is, such means as may be contrived to produce part or all of the oil that remains in the oil sand, after prevailing methods can no longer produce economically. Secondary recovery is of necessity more expensive than the primary effort, but the prize is still worth worrying about, for it has been estimated that from 50 to 75 per cent of the oil originally in the reservoir remains there after our best effort to remove it by conventional means. Naturally a great deal of experimentation has been devoted to the possibility of bringing this oil above ground by means of water flooding, gas drive, or what have you.

California has a number of projects under way but it is doubtful if any extensive recovery has yet been accomplished by secondary methods. Some valuable information has been developed, however, which when summed up mostly indicates that it is futile to start such a project until everything that can possibly be learned about sub-surface conditions is on tap. Permeability and porosity data of the most complete kind are necessary to a well organized effort, and it has been found in at least one project that certain types of bacteria in the injected water can gum up an otherwise promising layout. Treatment of the water with suitable bactericides, followed by filtration, took care of this particular trouble, and the experiment continues. Another species of secondary recovery that has been practised by a California operator with a marked degree of success, is the injection of light oil into heavy oil wells. This reduces the viscosity of the heavier material, and so a commercially profitable proportion of formerly non-producible oil migrates into the bore hole and is brought to the surface.

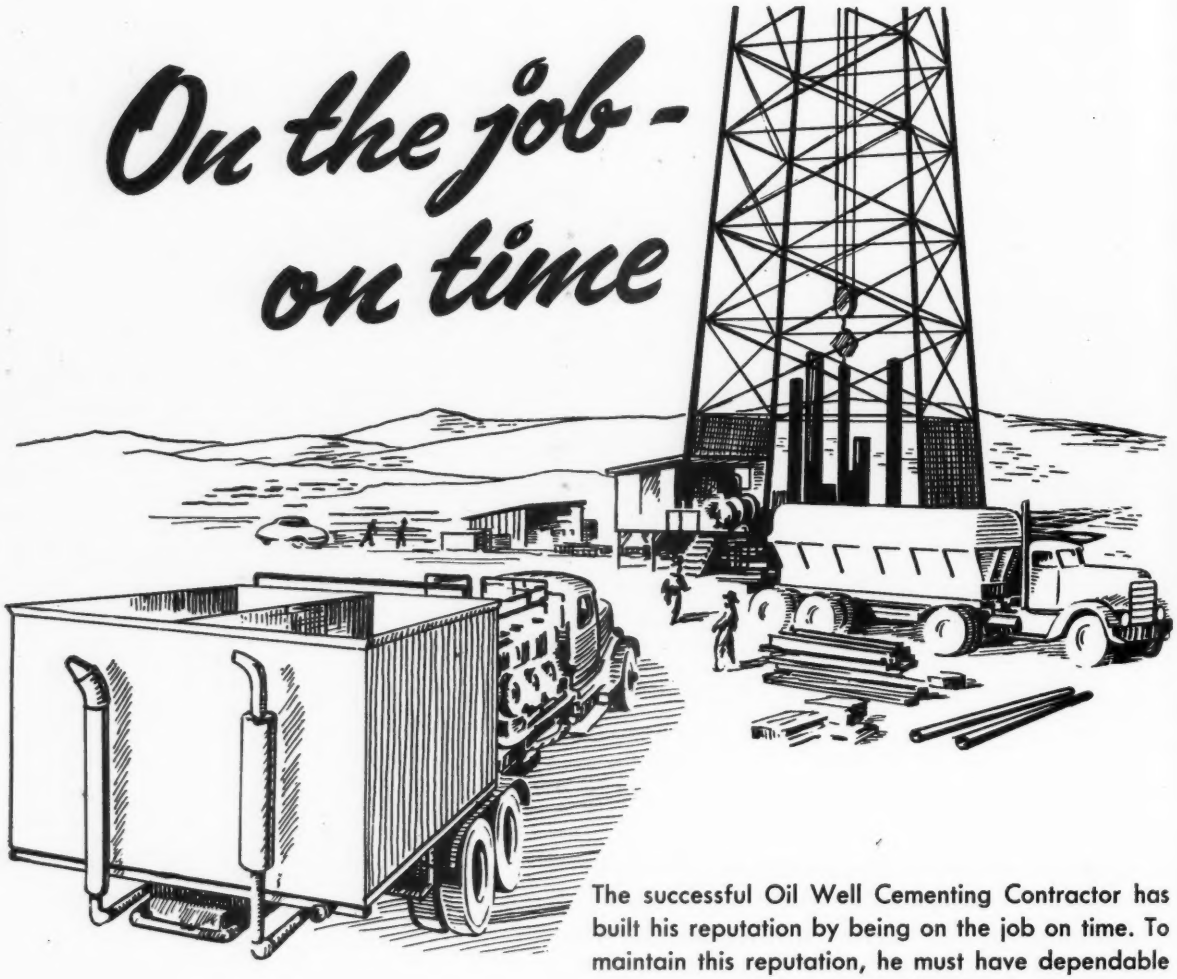
Some years ago there was introduced in California a system of subsurface storage that marked a real advance in conservation practice. This was first employed in 1929 when the State was suffering one of the most serious overproduction binges of its existence. The plan projected the use of depleted or partly depleted reservoirs for the storage of surplus production. Exhaustive tests were first conducted to make sure that the sub-surface reservoir was in fact a self-contained entity and that it was a safe repository. After that comparatively large scale operations were carried on, one at Brea and the other at Lompoc, and the results were entirely satisfactory. There was every indication of a full recovery of the injected oil, and, indeed, it is highly probable that the data developed in these projects were the stimulus for the light oil injection method of secondary recovery that has already been described.

The possibility of using certain types of bacteria to increase the recovery of oil from subterranean deposits is suggested by the work now being carried on at La Jolla, under the direction of Dr. Claude E. ZoBell. While testing various types of bacteria for their ability to modify crude oil, Dr. ZoBell observed that certain cultures released droplets of oil from test tubes filled with calcareous material prepared to simulate underground oil producing formations. Further experiments showed that these bacteria were able to release oil from samples of Athabasca oil sands, and Santa Maria shales. Indications are that the bacteria release oil from oil bearing sediments by dissolving calcareous materials, by crowding the oil off physically, and by producing surface active substances. The ability of the bacteria to grow in and to penetrate oil bearing sediments has been well demonstrated. Just how this may be applied to the increase of present production is not quite certain, but cultures have already



A well crew is in the process of starting a deep well pump into the hole. It is seen here hanging in the rod elevator, with the well pulling hoist at the left. Deeper drilling and directional holes have been responsible for many new pump designs.

On the job - on time



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been injected in certain wells, and while nothing very definite has been released on the results, there is evidence on the part of the experimenters of a subdued optimism. Dr. ZoBell, like all researchers, is careful not to make any extravagant claims, but the entire matter is one of extreme interest to the industry, and regardless of the ultimate outcome, is a bit of unusual research that will be watched avidly by all people, directly interested or not, who are intrigued by the resourcefulness of free enterprise. It might be appropriate to remark here that while the introduction of bacterial cultures in oil wells seems rather like using a toothpick for an elephant goad, the propagation of these tiny organisms is simply amazing. Dr. ZoBell stated at a meeting in Los Angeles some time ago that a new generation is born every half hour, and if the propagation were to continue for 24 hours without loss of any of the progeny and without failure of any to reproduce, at the end of that time we would have a mass of bacteria as large as the earth.

It seems that periodic predictions as to the final exhaustion of our crude oil supply have been going on ever since the industry began. When the author came to California in 1923, the research departments of several of the major companies, alarmed by a Bureau of Mines report, were trying desperately to find means of retorting shale oil and refining the product, so that when the oil supply petered out in the next ten years they wouldn't be caught wanting. In ten years we were in one of the worst overproduction periods in oil history. However, there seems to be good reason now to examine our waning resources with a critical eye, and the industry and all its agencies are engaged in a concerted effort to develop synthetic fuels from coal and shale, and to find methods of extracting oil from the Athabasca sands, others of the same or similar type, and impregnated rocks.

We have no fear that if in the end a substitute really does become necessary, the oil industry will come up with it. That has been the history of production since the bringing in of the Drake well. There never has been a single time when the industry failed to meet its own crises and handle them adequately. We have no regard for the people who always ask in fear and trembling, "What's going to become of the oil industry when atomic power is made available to commerce?" because we are profoundly confident that when and if a new source of power becomes available, the research departments of the oil companies will have helped in no small measure to have discovered and perfected it, and in all probability the oil industry will be among its manufacturers.

Water being pumped from flooded field by shaft-driven turbines to lower the water table and bring high structure wells back on to production. By this means over 2000 wells were placed back on production by Tide Water Associated in Kern River.

In conclusion, it should be pointed out that every oil company of any dimensions now has its own corps of engineers, chemists, physicists, and scientists of all types, specializing in the various phases of production. There seems to be little doubt, thus, that the production problems of the future are in capable hands, and that they will be solved just as surely and just as adequately as have those of the past. Oil is progressive!

New Shell Chemical Plant At Martinez

Construction is under way on a new Shell Chemical Corporation plant at Martinez, California, to manufacture "petroleum additives," it was announced recently by J. Oostermeyer, president of the company.

Petroleum additives, Oostermeyer explained, are chemicals which are added to lubricating oils and other petroleum products to increase their life and performance.

In the manufacturing process at the new Martinez plant, special emphasis will be placed on high quality, an important factor in the effective functioning of the additives. Production equipment will therefore be constructed of special materials which will help guard product quality during all stages of manufacture.

Ralph M. Parsons Co. is the contractor for engineering and construction of the additives plant. It is scheduled for completion late this year.

Progress is the American Way of life. The petroleum industry IS progressive.

Measurement and Flow Control Instruments Applied to the Modern Refinery

Concluded from
2nd Issue of March

By
Alfred Krieg,
Supervisor of Instrument Department
Socony Vacuum Oil Company, Inc.
Paulsboro, N. J. Refinery

Electronic Type Meters

Several flow meter manufacturers have recently added to their list of instrument equipment a meter with an electronic amplifier in the bridge circuit. See Figure 15.

One meter of this type uses as the transmitter a transformer with its primary winding on a non-magnetic tube and the double secondary concentrically wound over the primary. A manometer bellows positions the iron core in the non-magnetic tube of the transformer. The induced voltage in the secondary of the transformer is regulated by position of the iron core. The transformer secondary is connected to a slide wire in the meter forming a bridge circuit. The movement of the slide wire, through linkages, records the rate of flow.

Any voltage differential between the transformer and slidewire is amplified to operate a motor in the proper direction to rebalance the circuit by repositioning the slide wire.

A movement of 0.0127 MM. of the transformer core starts the motor circuit operation which provides high sensitivity. Also available with this type instrument are calculating systems to multiply, divide, totalize, multiply and subtract various quantities and groups of flow measurements.

A typical totalizing application of this type equipment is represented schematically in Figure 16.

The boiler meters on the control panels of the respective boilers in No. 3 Boiler House are represented by A, B, and C in the Figure. Steam output of the boilers is totalized on the flow indicator (D) in No. 3 Boiler House and transmitted to another indicator (E) in No. 1 Boiler House. The output of No. 1 Boiler House is totalized (on K) and transmitted to an indicator (L) in No. 3 Boiler House. The output of both houses (Nos. 1 and 3) is transmitted from instruments (E and K) to a recorder—integrator (R). This total is transmitted and indicated also at (M) in No. 3 Boiler House. With this system the individual house totals and power plant total output is made available for operation personnel.

Area Meters

The most simple of the area type meters are termed Rotameters and comprise a metal float enclosed in a tapered Pyrex glass properly supported for convenient observation on vertical installation. When a fluid is passed through the glass tube (from bottom to top) the metal float will rise and rotate. Figure 17.

Advantages of this type flow measuring device are high accuracy, the glass tube resistance to most fluids, and high reproductive accuracy. In the standard design pressure and temperature ranges are limited however, this may be overcome somewhat by making use of an extension arrangement over or below a metal tube. These extensions are similar in form to a sight glass or gauge glass, wherein an indicator connected to the float gives the flow reading. The flow scale is mounted alongside the tube or etched in the glass. A capacity change is conveniently made by replacing the rotor float and tube.

The turbulence created by the flow makes this tube self cleaning. If necessary in cases where the flowing fluid leaves a deposit, the glass may be cleaned with fluid and a brush through the top plug.

Pressure loss created by the rotor remains constant regardless of the float position and total pressure loss

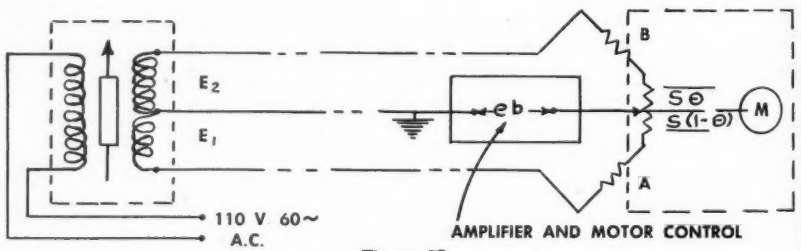


Figure 15

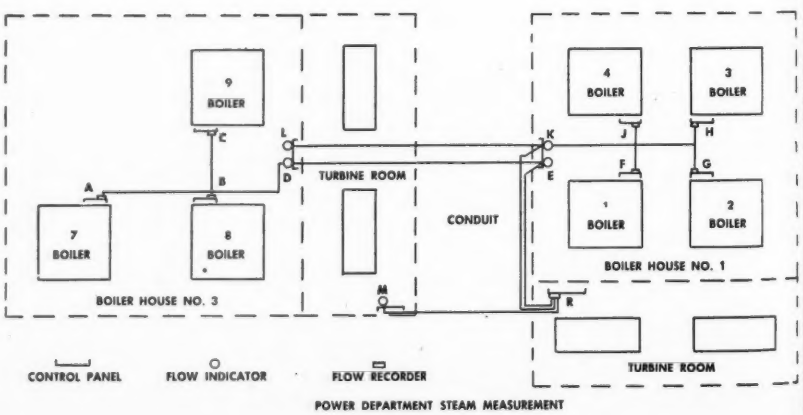


Figure 16

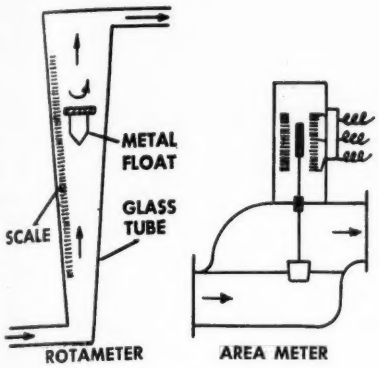


Fig. 17 Fig. 18

of small fractions of kilograms per square centimeters of water through the tube may be assured by the proper sizing of tube and rotor.

Due to coherent glass fragility, care must be taken to eliminate piping strain and the instrument should be installed in a location to minimize effects of water hammer or Thermal shock.

Many adaptations of the rotameter are available for measuring high velocities and capacities and for high and low temperature fluids by the "by-pass" method.

Electric type rotameters may be classified as another method of flow measurement. Recording — controlling, indicating and integrating types of rotameter instruments using the inductance bridge principle previously described are available. Pneumatic control and transmission systems are obtainable from Rotameter Manufacturers. Gravity readings from a continuously flowing sample through a Rotameter tube is listed in at least one manufacturer's standard catalog.

Another inductance bridge type area meter uses a body designed somewhat like a regulating valve body, Figure 18, and is inserted in the pipe line of the fluid to be measured. The fluid enters the body under a piston attached to an iron core armature and passes through an orifice to the opposite opening of the body. The piston forms a part of an adjustable rectangular orifice varied in size by the motion of the piston. Pressure on the body and piston is equalized by a built-in by-pass. Pressure differential on both sides of the orifice is held constant by the motion of the piston, and as only one dimension of the orifice is adjusted, flow graduations are equally spaced.

For proper installation the meter body should have twenty pipe diameters of straight pipe on the upstream or approach side, and a by-pass arrangement to permit removal.

Where the flowing fluid has a high viscosity, or is dirty or for tar and fluids difficult to measure by conventional orifice installation this type meter is exceptionally desirable.

Integrators

Where fluctuating flow conditions are non-existent or where totalization is required for short periods of time an instrument chart will supply such information. However, when measurement of utility services are necessary for accounting purposes on gas, water, air and steam distribution or on power station efficiency there are two methods generally employed.

The planimeter method mechanically averages the flow on either uniformly spaced or square root charts, and this semi-manual operation can be performed only after the chart has been removed from the meter.

Instruments are available which incorporate integration, making possible a totalized flow reading at any time and eliminating the inconvenience of the planimeter method.

The simplicity and dependability of an integrating mechanism should be considered in such selection since maintenance on the more intricate mechanisms may be costly.

Static Pressure Pens

Many flow applications for steam, gas or air where pressures are variable, it is necessary to have a record of static pressure for accurate measurement. Pressure has considerable effect on the flow coefficient of compressible fluids, and some types of mechanical meters are designed so that a static pressure pen and mechanism may be installed if required.

Some manufacturers have available integrators designed with a pressure compensating mechanism, which compensates for pressure changes at the time of each unit integration.

Square Root Compensation

The square root chart is more difficult to read at lower ranges and to overcome this, some manufacturers make use of an evenly divided chart. Various methods have been devised to accomplish this, i.e. by using (a) a parabolic type range tube (Figure 19a) (b) the formed bell as in figure 19b (c) or by introduction of a cam Figure 19c to extract the square root mechanically.

Although these methods of square root compensation permit use of the evenly divided chart, obviously, depending upon the method employed, the zero mercury level adjustment becomes more critical. When this condition exists, a slight mercury leakage may result in considerable error of flow readings, and such an error may continue undetected until the meter is checked for zero.

Ratio Flow Control

On applications where two fluids

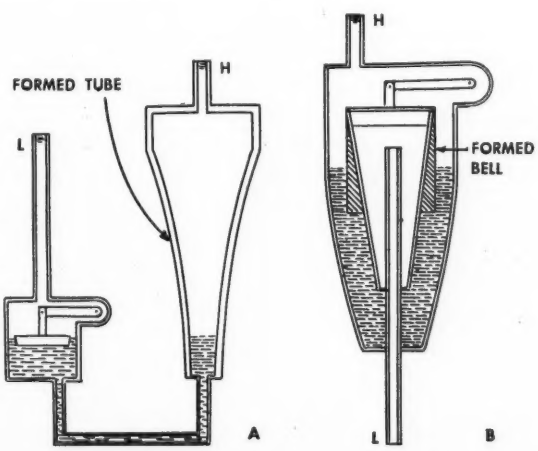


Fig. 19-a

Fig. 19-b

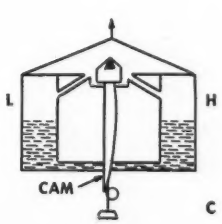


Fig. 19-c

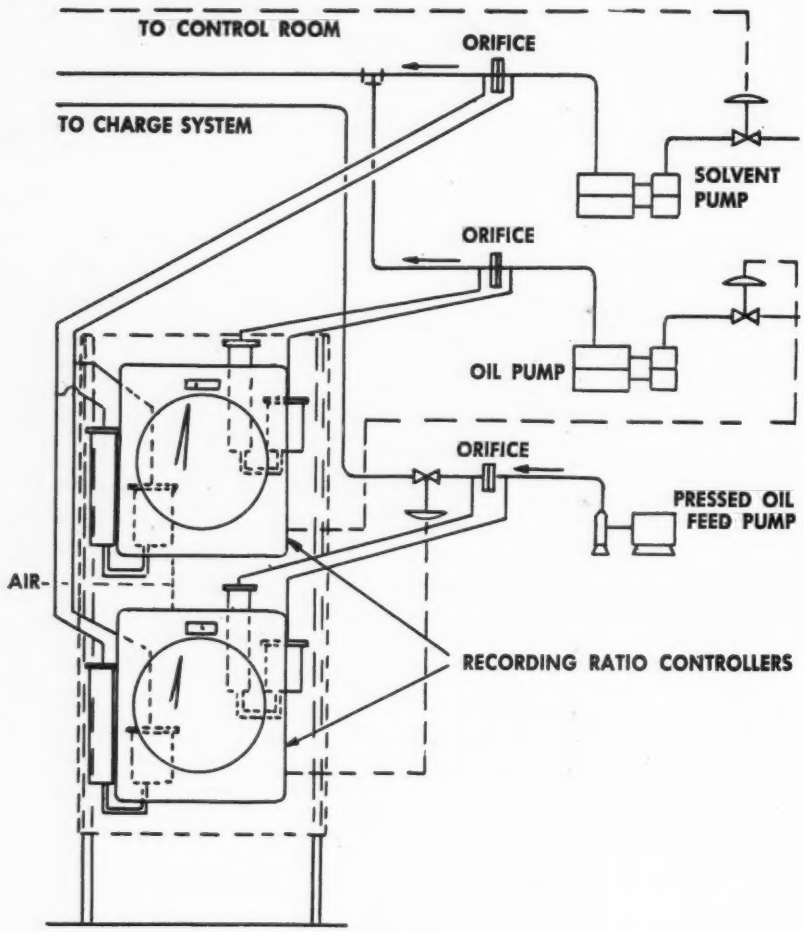


Figure 20

bear a definite ratio to each other, accurate regulation of proportioning is required. With automatic ratio control, the primary or "wild" stream is controlled directly by process action and the secondary, or controlled stream rate is maintained in required ratio to the primary flow.

The flow ratio controller is, in principle, the conventional flow meter with double sets of differential legs or chambers. These sets are connected to orifice assemblies respectively in the primary and secondary fluid lines. Orifices are calculated for the ratio between the measured fluids and ratio changes, within specific limits, are made inside the instrument case.

The primary flow mechanism, through suitable leakage, operates the setting device of the control mechanism to maintain the required ratio of fluids. Using this instrument, the primary fluid rate may be varied, and the secondary rate, through the controller, will vary correspondingly.

On such ratio control installation at the refinery, shown schematically in Figure 20, required the ratio of two secondary streams to the one primary flow. One ratio control instrument could be connected to accomplish this, however flow and control conditions on the No. 2 secondary stream required individual controller adjustment to assure accurate control and flexibility.

Volumetric Meters

The actual volume of fluid passing through is measured by the volumetric type meter and the total flow is indicated on a counter device. Many types of volumetric meters are available such as, the piston type, rotary sliding vane type, oscillating piston type, the rotating disc type, etc. See Figure 21. These meters as a type, make up an important group and thousands are in general use. Due to limited space available in this article, a detailed discussion of design and characteristics of these meters will be omitted.

The volumetric type meter is used extensively for total flow measurement especially on fuel loading racks and on delivery trucks where high accuracy is essential. The higher quality meters of this group have a guaranteed accuracy from 0.2 to 0.3 of one percent when properly installed and operated.

These meters as a type are easily installed, compact and portable. In the larger sizes the initial cost and repairs are expensive. They are only suitable for clean fluids as any foreign materials will damage or plug the meter ports and mechanism which causes high inaccuracies.

Control of Flow

Obviously, pneumatic "on-off" control is ample for many industrial applications. Where a definite sequence of control is required, as in the modern refinery process unit, any disturbance of a cycling action, such as "on-off" control is undesirable. Therefore this type of control has limited applications on continuous processes.

Proportional control will give satisfactory results on installation where load changes and process lags are not too unfavorable. Adjusted for wide throttling action, this type controller will give a small valve reaction which eliminates cycling.

When demand changes are large and unfavorable process lags are present, proportional reset control is best suited for the application. With unfavorable process variables, precision control is assured with this type of instrument.

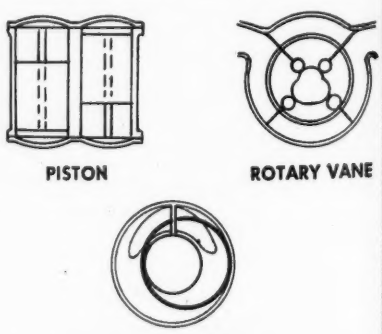


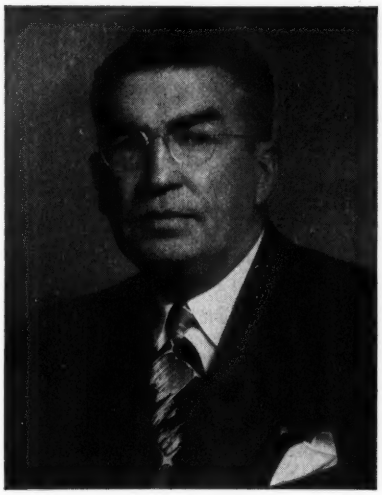
Figure 21

M. O. Johnston Celebrates 20th Anniversary of Formation Testing

Generally recognized as a pioneer in one of the revolutionary oilfield developments — Formation Testing —and having contributed materially to another important advancement — Gun Perforating — M. O. Johnston, pioneer oil man, inventor and manufacturer, is celebrating the twentieth anniversary of Formation Testing.

A family project, the Johnston Formation Tester was designed and built by the seven Johnston boys in the middle twenties while contracting and drilling wells in Arkansas. After further tests by M. O. Johnston on a well he was drilling in Alabama the first commercial run of the Johnston Formation Tester was made in Arkansas in May 1928. While J. L. Johnston introduced the tool in Texas, M. O. Johnston came to California and made the first Formation Test in the state's history for the Ohio Oil Company in July of 1930. A casing packer was soon developed and in 1931 the California State Mining Bureau, Division of Oil and Gas, approved the use of Formation Testers for water shut-off tests for well completions. Getting the new testing tool adopted was a slow, up-hill job until 1933 when its use in a well at Lost Hills Field, in which numerous oil companies were interested proved so effective that it became generally accepted by oil companies. Its use quickly spread to the entire domestic oil country and throughout the world. M. O. Johnston's development of numerous Formation Testing Accessories has added greatly to the testing tools' effectiveness.

M. O. Johnston has a unique oil background possessed by very few men. His father, R. C. Johnston, an old time Texas water driller, helped drill the famous Crazy Well at Mineral Wells, Texas, and moved to Beaumont, Texas, when the Spindle Top Field was discovered. He raised seven sons, all of whom spent their entire lives in the industry. Growing up under the spell of the Spindle Top Boom and other early Texas oil developments it is little wonder that "M. O." has been able to contribute so much to the industry's advancement.



M. O. Johnston

The imprint of M. O. Johnston's development efforts has also been felt on Gun Perforators. When he came to California in 1930 he also brought with him the patented Rembert Gun Perforator—a mechanical 4-shot gun which he had run in Arkansas. Before relinquishing his interest in this tool he developed an electrical firing device. More recently he took a partially developed gun perforator and made it into the safe and highly efficient mechanically-operated hydrostatically-fired tool now known as the Johnston "Shoot-N-Test" Gun Perforator. This companion tool for the Johnston Formation Tester is an all-purpose Gun Perforator which can be used either for perforating alone, or when attached to the Johnston Formation Tester and Pressure Recorder, as a unit in combined perforation and formation testing operations.

Another piece of equipment in which "M.O." has played an important development role is a Casing Packer for testing purposes. His work in this field was responsible for the advanced design widely used today.

Oil men have the greatest confidence in the equipment "M.O." designs and builds because he knows both the worker's and the operator's problem from first-hand experience and is always striving for greater safety and practicability. A close associate recently said of "M.O.", "he knows oil tools as few men do. His judgment of what is practical is very astute. When he takes a new idea he explores all the possibilities. Hours mean nothing to him when he is working on a project. He thinks a design over thoroughly and when he has decided it's right he goes into action immediately."

The Johnston Brothers, left to right: E. L., M. O., R. C., J. L. and E. C. (Blaine and J. T. have died). All seven of the boys were instrumental in developing the Johnston Formation Tester.

Field Development

PREPARED FROM CALIFORNIA OIL WORLD NEWS SERVICE

Los Angeles Basin

Castaic Wildcat Plan New Outfit

Castaic reports indicated that L. R. Wilhite and Claude Kavanaugh were planning to move out light equipment from their Wilhite-Jenkins No. 1 test in Sec. 18-5n-16w and in turn install heavier equipment. The larger outfit will be used to drill deeper from present depth of 1965 ft. for a look at formations on down.

Cleveland Oil Takes Beach Wells

Cleveland Oil Co. has acquired six new wells near 21st and Magnolia streets at Huntington Beach. They are Four Oil Co., Lee No. 9; S. C. Thomas & Sons, No. 1; and A. & G. Oil Co., Lester No. 1 and No. 10, Stone No. 1 and Getty No. 1.

Brea-Olinda Try Coring

Spot coring at 4801 ft. is the current status of Union Oil Co.'s Gaines No. 1 prospect job in Sec. 10-3s-9w at Brea-Olinda.

Canoga Park Wildcat Idle

Vincent F. Stabeck's Knapp No. 4 in Sec. 14-1n-17w at Canoga Park evidently is idle at 790 ft., after the hole was bailed dry. Drilled to a total depth of 790 ft. and subsequently plugged back to 510 ft., the well bailed muddy water with slight oil showings.

Richfield Oil Corp.'s well A-1 in the Long Beach Field. Loffland Bros. contractors. Front row, kneeling, left to right: Bill Knowles, pipe racker; Clem Kelly, cat head; rear row, left to right: John H. Rice, lead tong; W .O. Goode, derrick; "Slim" Adney, driller.

Talbert Test Pumping Crude

Shell Oil's new Lamb Comm. No. 51-6 well in Sec. 6-6s-10w in the Talbert area is pumping an estimated 125 barrels of clean 17 gravity oil daily from a plugged bottom of 5850 ft. Original depth is 7834 ft.

Seal Beach Well Drills

Marine Exploration Co. is drilling at 3750 ft. with State No. 2 in Sec. 11-5s-12w at Seal Beach, which is scheduled to bottom under the ocean floor approximately one mile offshore. The 20-in. pipe was set at 307 ft.

Newhall Try Quits

Four miles west of Newhall, Bankline Oil Co. has called a halt to drilling at 9996 ft. in its Newhall Corp. No. 1 in Sec. 31-4n-16w. Absence of major showings to bottom brought about abandonment of the project. Mutual Development Corp. is spot coring at 4200 ft. with Sanborn No. 2 in Sec. 6-3n-16w. Electric log was run to 4000 ft.

Aliso Canyon Try Cores Sand

Standard of California is drilling at 7610 ft. in Del Aliso No. 2 wildcat in Sec. 29-3n-16w in the Aliso Canyon area, after coring oil sand from 6318-6338 ft. Houghton Comm. No. 1-1 near the Santa Fe Springs field is making hole ahead at 13,805

ft. The electric log surveyed to 13,761 ft. Lomita Land & Water Co. No. 3-1 is a location in Sec. 19-5s-11w at Sunset Beach.

Athens Test Grading Site

Southern Calif. Pet. Corp. is grading location for No. 86-1 test in Sec. 12-3s-14w in the Athens area.

Los Angeles Well Flowing

E. W. Pauley has brought to successful completion an excellent well at East Los Angeles. Tagged Pacific Tube-Stewart No. 1, the new producer is flowing 521 barrels of 34.6 gravity oil, cutting 1.8 per cent, along with 300,000 cubic ft. of gas daily through a 14/64-in. bean. Location falls on the site of the Pacific Tube Co. plant, prominent in defense work during the war. When hostilities came to a close, the plant and surface rights were purchased by Pacific Tube from the War Assets Administration, and the mineral rights sold to Col. D. D. Stewart of Lexington, Ky. The well, on Sec. 9-2s-12w, was carried to a total depth of 8430 ft. Richfield Oil's Boyle Comm. No. 17-1 in Sec. 35-1s-13w is digging at 2640 ft. L.A. River Comm. No. 1-IA in Sec. 34-1s-13w is redrilling at 1285 ft.

Richfield Test Digs

In the Richfield area in Orange County, R. L. Wheelock, R. L. Collins, J. S. Abercrombie and H. S. Porter are boring in brown shale at 2650 ft. with J. C. Travis No. 1 wildcat in Sec. 31-3s-8w.

Lawndale Test Fishes

In the Lawndale area, Seaboard Oil is fishing drill pipe stuck in its Seaboard Comm. No. 6-1 in Sec. 20-3s-14w. Total depth is 6030 ft., with top of fish at 5871 ft. No. 5-1, No. 7-1 and No. 8-1 are locations in the section. The company's Pauley Seaboard No. 61-20 in the section is drilling hard shale at 6740 ft.

2417 Porter St.
Los Angeles 21, Calif.
TRinity 4023
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Dominguez Well Pumps

Completed pumping and flowing by heads, Morton and Sons' Dominguez Estate No. 1 test in the Dominguez area is making 200 barrels of 28 gravity oil daily, cutting 2 per cent, along with 200,000 cubic ft. of gas. Total depth is 8144 ft.

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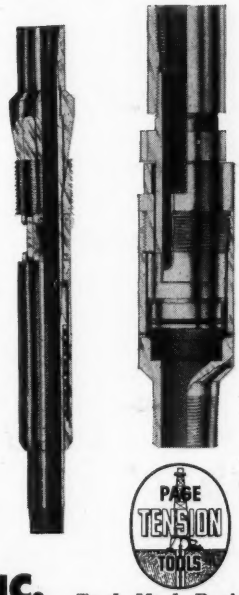

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Santa Maria Drilling Co. contractors on General Petroleum Corp.'s Price Ranch No. 1 in the Gato Ridge Area. Front row, left to right: L. T. Buckelew, derrick; Z. J. Kahn, back up; rear row, left to right: W. T. Buckelew, cat head; W. D. Graham, H. S. Smith Oil Tool Co. Repr.; Wm. Cooper, lee tong; Tony Schumacher, driller.

Whittier Try Swabs

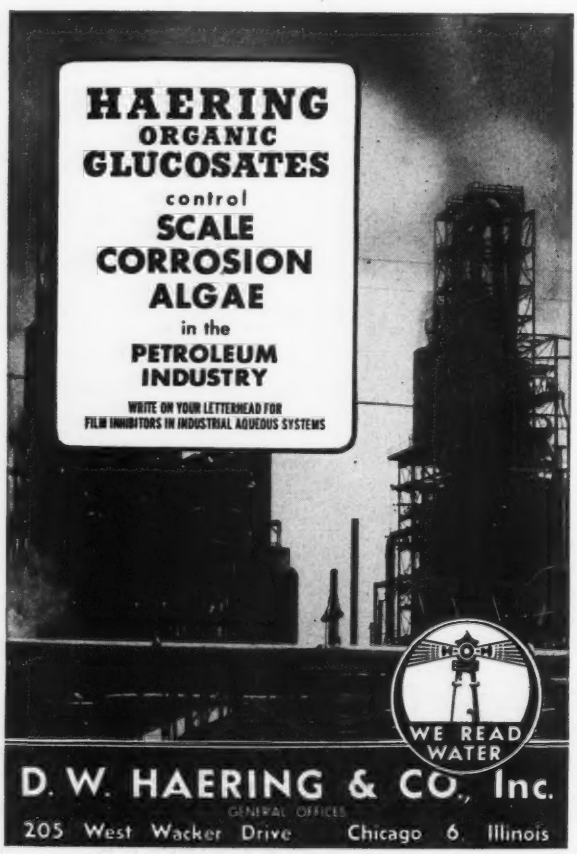
Oil, mud and a little salt water was swabbed from Livingston Drilling and Dev. Co.'s Dewey No. 1 in Sec. 1-3s-11w at East Whittier. Drilled to a total depth of 8521 ft., the project gives promise of ending up as a successful producer.

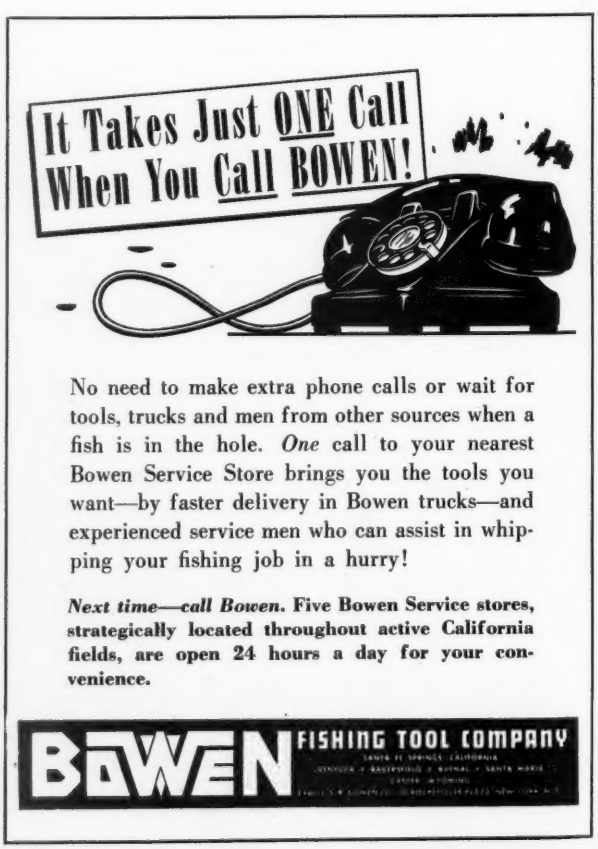
Lawndale Adds Test

General Petroleum has locations staked for Powell No. 1 in Sec. 21-3s-14w at Lawndale and Los Cerritos No. 1 in Sec. 13-4s-13w at Long Beach. General's Industrial No. 1 in Sec. 8-2s-12w at East Los Angeles is drilling ahead below 9250 ft. Two formation tests higher in the hole showed oil traces.

Beach Wildcat Running Witch

Seguro Petroleum Co. is running water witch in Seguro No. 1 deep test at Huntington Beach in an attempt to locate water entry. Total depth is 9134 ft., with plug at 8400 ft. and casing set at 7810 ft.

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San Joaquin Valley

Temblor Test Drilling Ahead

Continental Oil's British-American-Dodds-Thomas Unit No. 1 wildcat test in Sec. 22-30s-20e in the Temblor area in San Luis Obispo County is drilling ahead at 3976 ft. Showings encountered not far below grass roots were due to Pliocene outcrops. The company divides interest with British-American in the 1000-acre lease surrounding the drill site.

South of the Ten Section field, KCL No. O-1 in Sec. 9-31s-26e is prospecting on down at 9079 ft. Santiago No. 1 in Sec. 8-11n-22w in the San Emigdio area is making hole at 9638 ft. KCL No. L-2 in the section is coring oil stained sands at 13,099 ft.

Wheeler Ridge Wildcat Starts

Richfield Oil is embarking upon another prospect job in the Wheeler Ridge area of Kern County. The new test, designated KCL No. C-2, will drill in Sec. 29-11n-20w. This location falls about one mile west of Standard Oil's discovery well completed in 1922.

Richfield's previous test in the area was abandoned last December after uncovering nothing of importance to a depth approximating 7000 ft.

The company has spudded Shaw No. 1 test in Sec. 8-29s-29e at Ant Hill and is drilling at 11,020 ft. with M. & L. No. 78-24 in Sec. 24-31s-25e in the Paloma area. Richardson No. 1 in Sec. 18-29s-21e near Salt Creek is fishing drill pipe stuck at 982 ft. Present depth of the hole is 7332 ft.

Shale Hills Test Deeper

General Petroleum's Berry No. 11-15 wildcat in Sec. 15-28s-20e in the Shale Hills area continues to make progress with the drill at 9429 ft. Ninkovitch No. 62-9 in Sec. 9-30s-21e in the McKittrick area is preparing to retest following packer failure on a trial of the interval of 9580 and bottom at 9607 ft.

McKittrick Wildcat Rigs

Texas Co. is rigging and awaiting tools to start drilling its Westpet NCT One No. 15-29 in Sec. 29-30s-22e in the McKittrick area. The company's No. 87-29, which recently staged a gas fire after abandonment, is being worked over. The well, located in Sec. 29-30s-22e, is grading for a mast rig, moving in equipment and cleaning up. Hogan No. 1 test in Sec. 4-31s-29e at Mountain View is drilling at 817 ft. Voight Two No. 1 in Sec. 32-27s-20e in the Antelope area is coring at 5504 ft. Texaco, in company with Independent Exploration, has made location for KCL No. 2 in Sec. 6-10n-20w in the old Wheeler Ridge area, about one mile south of the Maricopa cut-off.

Cuyama Try Drills Deeper

On the south side of the Cuyama river, Navy Oil Co. continues to drill ahead at 4154 ft. with Kirschenmann No. 1 wildcat in Sec. 12-10n-27w in the Cuyama Valley area, San Luis Obispo County.

McFarland Try Drills

Northwest of Bakersfield in the McFarland area, Independent Exploration is drilling at 607 ft. with Wright Bloemer No. 1 test in Sec. 11-26s-26e, Kern County. Property holders in the area include Union, Pacific Western, Western Gulf and Honolulu.

San Emigdio Well Finished

Apex Petroleum's new Los Lobos No. 3 producer in Sec. 5-10n-22w in the San Emigdio area at this writing is yielding 7 barrels of 28 gravity oil daily, cutting slightly. Total depth is 1481 ft.

Devils Den Venture Idle

Idle at 1305 ft. is the report from S. R. DeKalb's Blake No. 16 in Sec. 25-25s-18e at Devils Den in Kern County.

Bacon Hills Try Coring

Seaboard Oil has reached a depth of 5924 ft. in No. 58-21 in Sec. 21-

In the Ventura Avenue field at Shell Oil Co.'s Edison No. 51. Left to right: Louis Asimakis, derrick; Clyde Humphrey, rotary helper; Russell Alberts, driller; Gilbert Eskridge, floorman; Warren Deppe, rotary helper.

In the North Elwood Area, Rice & Firestone's well No. 3, Brown Drilling Co., contractors. Left to right: M. L. Hansen, back up; L. W. Ham, driller; Dick Heess, cat head; R. W. Turner, derrick; W. D. McArthur, lee tong.

28s-20e in the Bacon Hills area, with drilling and spot coring continuing ahead. This is the company's fourth project in the area.

McKittrick Test Drills

Bankline Oil Co. is drilling steadily ahead at 4460 ft. with McKittrick No. 3 test in Sec. 12-30s-21e near the McKittrick field. East Puente Oil of Calif. is preparing to drill Lease No. 2 and Home Lease No. 25 in Sec. 11-30s-21e in the area. Union Oil is rigging R. K. No. 1 in Sec. 34-30s-21e.

Bacon Hills Adds Interest

Western Gulf is entering the Bacon Hills area. It has staked location for Spencer A-U.S. No. 18-24 in Sec. 34-28s-20e. U.S.-Case Comm. No. 1 in Sec. 23-11n-23w in the Santiago area is idle at a redrilled depth of 3048 ft. Old depth is 3483 ft. On the dry bed of Buena Vista Lake, BVA No. 18-3 in Sec. 3-32s-25e is prospecting ahead at 9720 ft.

Globe Anticline Try Wall Sampling

Having run electric log to bottom of the hole at 5580 ft. Shell Oil

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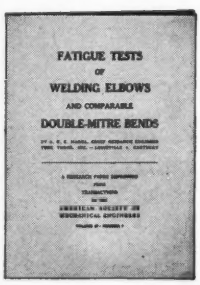

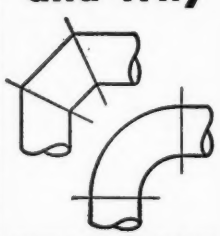

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Co. is now taking sidewall samples from its Vedder-USL No. 1 exploratory project in Sec. 9-31s-22e in the Globe Anticline area, Kern County.

Arvin Well Completed

British-American Oil Prod. Co. and the Capital Co. have completed their joint Arvin Comm. No. A-47 in Sec. 26-31s-29e in the Arvin area for an initial yield of 230 barrels of 35 gravity oil and 100,000 cubic ft. of gas daily through a 17/64-in. bean. Total depth is 8638 ft. Louis H. Didier's Didier No. 1 wildcat in Sec. 10-31s-30e is idle at 2350 ft. in granite.

Gosford Test Makes Location

Gene Reid Exploration Co. has location made for No. 1 wildcat in Sec. 21-18s-25e in the Gosford area, Tulare County. The company also is starting a new test in the Comanche Point area in Kern County. The latter is known as No. 6 and located in Sec. 32-12n-18w.

Raisin City Try Rigs Pump

Pump is being rigged for Real Oil Co.'s San Joaquin No. 1 in Sec. 11-15s-17e in the Raisin City area of Fresno County. Redrilled depth is 5227 ft., with top oil sand at 5212 ft.

Coalinga Try In Shale

Sharples Oil Corp. has reached a depth of 8673 ft. in heaving shale with Hyde No. 3 at Northeast Coalinga in Sec. 6-19s-16e, Fresno County. Kreyenhagen shale was encountered at 6410 ft., Fleishacker sand at 7555 ft., Hondo shale at 7700 ft. and Gatchell sand at 8200 ft.

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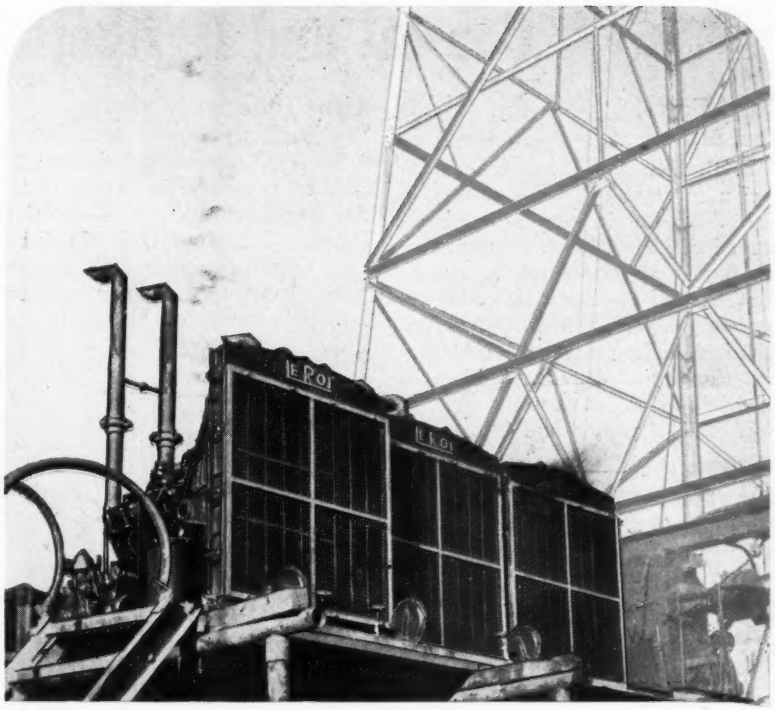

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San Miguel Test Slated

E. B. Hall & Co. has staked location for No. 25-7 wildcat test in Sec. 7-25s-13e in the San Miguel area, San Luis Obispo County. Location falls approximately two miles southeast of Mahoney No. 36-2 exploratory hole, which was abandoned after finding only sub-commercial showings. Acreage holders in the vicinity of the new test include Barnsdall, Bankline and Oceanic.

Denverton Test Listed

Still a location is Honolulu Oil Corp.'s McCormack Estate No. 1 gas test in Sec. 36-5n-1w in the Denverton area in Solano County. Location is about two miles north of National Investors Fund's abandoned Burke & Donohue No. 1 explorer.

Stockton Try Starts

Amerada Petroleum has made location for Martenet No. 25-2, a wildcat test in Sec. 2-2n-8e in the Stockton area of San Joaquin County.

Kirby Hills Try Drilling

Shell Oil is making hole ahead at 3772 ft. with Harper No. 1 test in Sec. 14-4n-1w at Kirby Hills, Solano County. Meridian Unit No. 2-1 in Sec. 17-9n-1e in the Meridian area, Yolo County, is standing with surface pipe cemented at 498 ft.

Petaluma Test Due

Trico Oil and Gas Co. is getting ready to begin work on a wildcat test in the Petaluma area of Sonoma County. It will be labeled Petaluma Comm. No. 5-2 and drill in Sec. 30-5n-6w.

Lompoc Try Grades Ground

Location is being graded for Union Oil's Crandall Government No. 1 test in Sec. 11-7n-33w east of Lompoc in Santa Barbara County.

Zaca Tests Progressing

Drilling in Tide Water Associated's Davis No. 35 wildcat in Sec. 33-8n-31w in the Zaca area in Santa Barbara County has reached 4537 ft. Chamberlin No. 22 in the section is grading. Luton No. 93 in Sec. 29-8n-31w is rigging.

Shell Oil Co., Inc.'s well, Alamitos No. 49A at Signal Hill. Front row, left to right: A. C. Ellis, driller; T. C. Slayton, lead tong; rear row, left to right: V. B. Douglas, derrick; C. E. Hillhouse, cathead; W. D. Larrick, pipe racker.

San Ardo Try Casing

Texas Co. is ready to run casing in its Rosenberg No. 3 prospect job in Sec. 34-22s-10e in the San Ardo area, Monterey County. The hole was plugged back from 2478 ft. to 2190 ft.

Simi Try Drilling

Cal-Ven Petroleum Corp. is drilling at 760 ft. with Wiekhorst No. 1 wildcat in Sec. 11-2n-18w at Simi in Ventura County.

Huasna Wildcat Planning Tests

Danciger Oil & Refining Co. has plugged back to 4850 ft. with Twitchell No. 1 in Sec. 35-32s-15e in the Huasna area, preparatory to cementing 850 ft. of blank liner on top of plug. Gun perforating and testing will follow the running of liner. Old bottom is 5626 ft., with casing cemented at 4062 ft.

Elwood Try Redrilling

In the North Elwood area, J. W. Rice and Leonard Firestone are redrilling at 2346 ft. with Firestone No. 3 in Sec. 14-4n-29w, Santa Barbara County.

Tar Creek Project Digs

At Tar Creek in Ventura County, Republic Operator, Inc., is drilling near 1925 ft. with Brunton No. 1-A wildcat in Sec. 29-5n-19w. McGregor-Agnew No. 7-1 in Sec. 7-4n-21w is grading.

Santa Barbara Test Scheduled

Independent Exploration's No. 1 on the Sudden Ranch in Sec. 26-6n-36w near Point Conception in Santa Barbara County is still a location only.

Olivera Canyon Try Laying Lines

Pacific Western Oil Corp. is laying water lines for Williams Holding No. 1 exploratory venture in Sec. 18-9n-32w in the Olivera Canyon area, Santa Barbara County.

Sulphur Mtn. Test Drilling

At Sulphur Mountain in Ventura County, L. M. Lockhart is digging deeper at 2813 ft. in Macrate No. 2 in Sec. 27-4n-23w, Ventura County.

Goleta Test Drills By Fish

Drilling by fish at 6920 ft. is the current operational stage of Honolulu Oil's Honolulu-Signal-Macco State No. 309-2 in Sec. 19-4n-28w in the Goleta area. Water shut-off on the 7 in. casing set at 6426 ft. was okay.

Sespe Try Digs

Prospecting is going on down below 1200 ft. in Eagle Rock Petroleum's Eagle Rock No. 1 wildcat in Sec. 36-5n-20w in the Sespe area.

Montalvo Tests Making Progress

Standard of California at last reports was drilling at 7969 ft. with Eastwood No. 1 test in Sec. 33-2n-22w at Montalvo. McGrath No. 62-4 in Sec. 30-2n-22w is making hole at 7610 ft. Richfield Oil's Baillard Mee, meanwhile is exploring at 8225 ft. Drill site of the latter is in Sec. 20-2n-22w.

Ojai Wildcat Tests Shut Off

Richfield Oil is testing water shut off on casing set at 3040 ft. in Ojai No. 53 wildcat in Sec. 13-4n-22w. Total depth is 4461 ft. Ojai No. 54 in Sec. 14-4n-22w is a location.

Saticoy Try Fishes

Superior Oil has recovered drill pipe fish to 12,774 ft. in its Saticoy No. 1 wildcat in Sec. 10-2n-22w in the Saticoy area. Wash pipe, however, is now stuck at 12,874 ft. Present depth of the project is 13,581 ft.

Gato Ridge Well Deeper

Near the Gato Ridge field, General Petroleum is drilling at 5815 ft. in Price No. 1 wildcat in Sec. 18-8n-32w, Santa Barbara County.

San Diego Try Starts

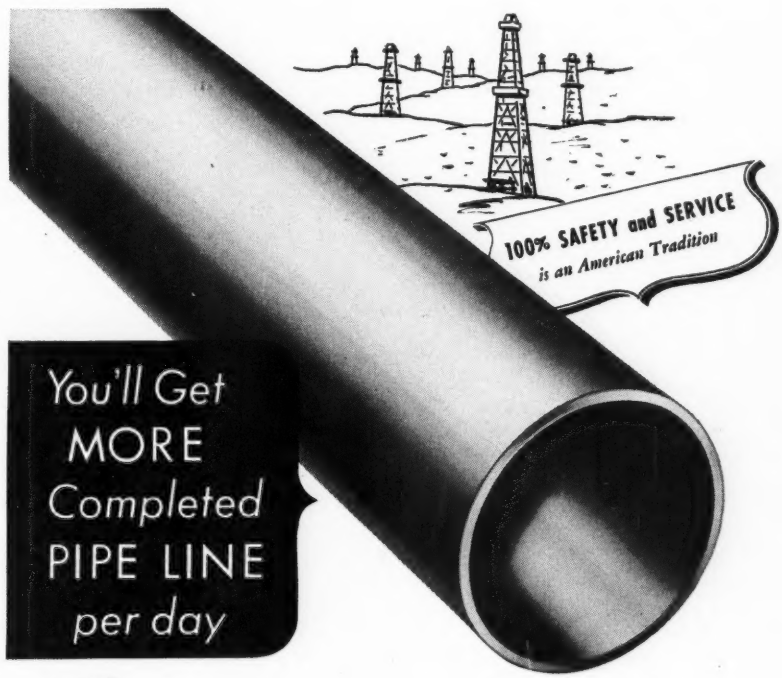
In the Oceanside area of San Diego County, Charles F. Holmes is preparing to start work on his No. 1 explorer in Sec. 31-11s-4w.

Edison Wildcat Rigging Derrick

First National Finance Corp. is rigging DeMille-First National-Biggar No. 1 test in Sec. 17-30s-29e in the Edison area. The company's DeMille-First National-Jeppi No. 1 in the section has been completed at 3449 ft., but evidently pumps off. The latter is credited as a new fault block discovery.

Sharktooth Venture Quits

B. C. Mackey's No. 16-1 explorer in Sec. 16-28s-28e in the Sharktooth area has been abandoned at 3030 ft. in gray sand. Top Vedder was placed at 3010 ft.



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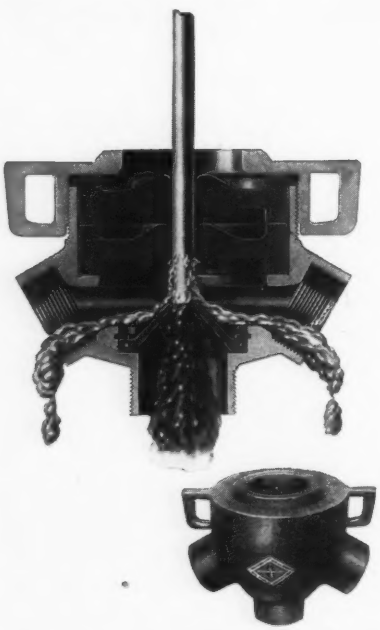
Patterson-Ballagh Announces New Sucker Rod Wiper

This compact new Patterson-Ballagh Sucker Rod Wiper, code: SUBAGENT, strips oil and paraffin from all size rods, squares and couplings. Improved design of the rubber wiping elements allows expansions from ½" to 2⅜" which is a great advantage in wiping combination strings. Rods may be pulled as fast as necessary with no oil flipping out on the crew.



Small conical rubber wiping element below two main wiping elements acts as one way valve. It prevents paraffin that has been stripped from falling back in the hole. Main wiping elements will take enough pressure to allow crude to flow to tank if well makes a head.

Compact design of this wiper allows right height for wrenching. Available with any standard connecting threads and with a spark proof lid when requested. Main rubber wiping elements can be supplied with oversized wiping hole.

Web Wilson Announces Newly Designed 125 Ton Connectors

The new series 125 Web Wilson connectors have been designed to eliminate all load-carrying threads. In place of the threads a shear ring has been incorporated on the main shank. The heat treated alloy steel shear ring gives extreme strength and simplifies assembly and disassembly in the event that repairs are ever required. These new Web Wilson Connectors are designed for their rated capacity with a safety factor of four to one on the ultimate strength of the steel.

A factor of great importance is the extreme simplicity of design. This results in a lower initial cost, fewer and less costly repairs and fewer spare parts to be warehoused.

The length of all Web Wilson Connectors is kept to the maximum to allow maximum working room in the derrick or mast. Also, these connectors are designed for direct connection to the bottom of most makes of traveling blocks.

A simple, positive locking device, consisting of only three parts, locks the connector in any of eight different positions. The lock may be operated from the derrick floor by a Hook Rod furnished with each connector.

An exclusive feature of the Web Wilson Connector is a full oil bath in which the plunger and the bearing operate. This oil cushion assures perfect lubrication of the bearing and provides a controlled, hydraulic cushioning action for the spring. This feature prevents the drill pipe from bouncing when breaking-out and greatly increases the life of threads and tool joints. These are the only connectors with a full oil-bath for the main bearings. They are adequately sealed against the intrusion of foreign material or the leakage of lubricant.

Large link recesses on either side of the body will accommodate any

standard drilling or production link in use today. All load carrying parts on Web Wilson Connectors are magnafluxed and thoroughly tested to assure perfection of quality.

National Supply Issues New Bulletins

Consolidated Rig. Bulletin 348. Describes and fully illustrates the Ideal Type T-25 Consolidated Rig, which has a nominal depth rating of 4000 feet using 4½ inch drill pipe with 250 HP input which may be obtained by using one or two engines. This rig is also well suited for workover jobs to 10,000 feet with 2½ inch tubing with hoisting speed comparable to drilling practice. Because of torque converter in the draw works transmission, a wide range of engines within horsepower rating, can be used by merely changing the size of the engine drive

sprocket. This skid mounted rig may be moved as a unit with the engine or engines in place. Included in bulletin are specifications, construction details and descriptions of accessory equipment. For requests write, The National Supply Company, Toledo, Ohio.

Slush Pump. Bulletin 323, 16 pages, Ideal Type C-100 duplex power slush pumps, designed to discharge 380 to 190 gallons per minute at pressures of 520 to 820 psi., are described and fully illustrated. The bulletin contains descriptions and illustrations of all main members of the power end and fluid end, including fluid valves and seats, liners, pistons and rods; lubrication, including a feature preventing mud contamination of crankcase oil; specifications, performance chart, and drawings with principal dimensions. Copies are available from The National Supply Company, P. O. Box 899A, Toledo, Ohio.

Inglewood Try Slated

Block's Oil Co. of Beverly Hills is preparing to drill a 2500-ft. test well in the Inglewood field. The company is headed by Sam and Milton Block. Basin Oil is drilling at 4762 ft. with Inglewood Comm. No. 1-1. No. 7-1 in the section is drilling at 10,140 ft.

Anderson Introduces New Piston

Neal H. Anderson Oil Tool Co. announces a new Slush Pump Piston and Rod to be known as the Anderson BULLDOG.

This Slush Pump Piston and Rod incorporates new features in design, in that the piston and rod are effectually a single unit, and eliminates all possibility of the piston working loose on the rod.

Another feature permits converting to any liner size without changing the rod or using a piston puller.

The same piston is interchangeable to any rod diameter or make of slush pump.

The Medearis Oilwell Supply Co. has been appointed California factory distributors, and have a complete line in stock. Pistons and rods may be purchased from them or through authorized field stores.

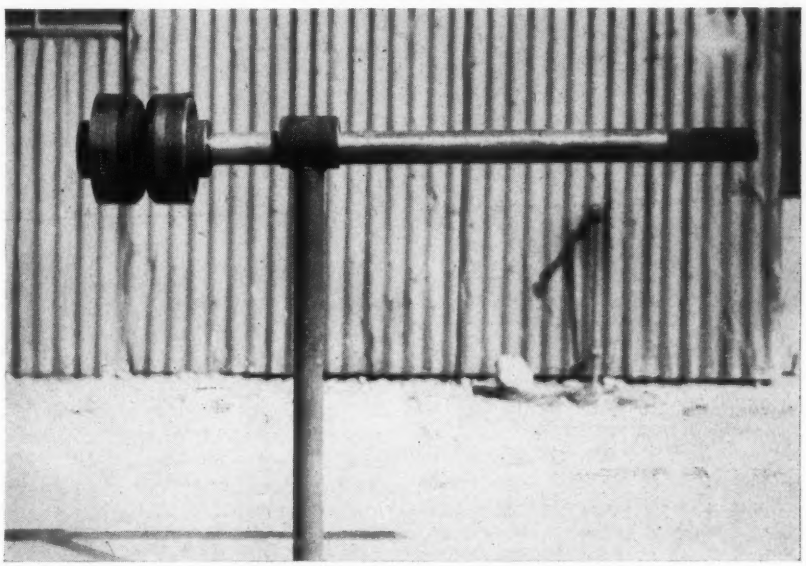
In the Montalvo Area, Richfield Oil Corp.'s Baillard Mee No. 1, Rocky Mt. Drilling Co., contractors. Front row, left to right: A. R. Hawkins, H. C. Smith Rep.; J. A. Kimberger, derrick; George Parker, driller; rear row, left to right: C. V. Martindale, floorman; Charlie Morgan, cat head; A. J. Huffman, floorman; Tod Gifford, tool pusher.

Palmdale Test Digs

Near Palmdale in Antelope Valley, Antelope Valley Dev. Co. is exploring at 3389 ft. in Del Sur No. 1 test in Sec. 26-7n-13w, Los Angeles County.

Sharktooth Test Coring

Coring oil sand at 2854 feet is Barnsdall Oil's Alma No. 6 in Sec. 15-28s-28e in the Sharktooth area. The Vedder was topped at 2834 ft. Location for Alma No. 7 has been made in the section.



The Anderson Slush Pump Piston and Rod.

Personalities IN THE NEWS

Tyrrell and Olney Advanced by Twin Disc Clutch

The Twin Disc Clutch Company, Racine, Wis., manufacturers of clutches and hydraulic drives, recently opened a new Branch Sales Engineering office in Los Angeles. The Los Angeles office is located in a newly-constructed building at 2950 Leonis Blvd., and serves a territory including California, Arizona and Nevada.

Pierce Tyrrell

Opening the Los Angeles office brings the number of such Branch Engineering Offices maintained by the Twin Disc Clutch Company to eight.

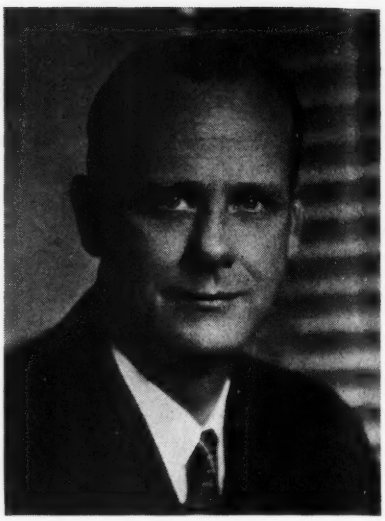
All Twin Disc activities on the West Coast are under the general supervision of A. E. (Duke) Young, District Manager. Sales functions of the California territory are under the direct supervision of Pierce Tyrrell, Assistant West Coast District Manager. Mr. Tyrrell previously was associated with the Twin Disc Hydraulic Division, Rockford, Illinois, in a sales and engineering capacity. His experience ably fits him to offer valuable advice and suggestions to manufacturers with power transmission problems.

Preston Olney, formerly field service engineer at the Dallas, Texas, Branch Engineering Office of Twin Disc, is manager of the new Los Angeles office. Mr. Olney joined the Twin Disc Clutch Company at Dallas in 1939. In 1941, he helped to establish a Twin Disc office in St. Louis, Mo., and two years later was transferred to the Twin Disc Hydraulic Division, Rockford, Illinois, as an installation engineer. He returned to the Dallas office in 1946. As manager of the Los Angeles office, Mr. Olney will supervise parts distribution and normal service requirements.

Preston Olney

The new Los Angeles Office is equipped with the best machinery available to provide factory repair service. It has an ample stock of replacement parts, competent service mechanics and a modern display room for new products. Floor space totals approximately 7,750 square feet.

Progress is the American Way of life. The petroleum industry IS progressive.



R. W. HEATH
Finance and Budget Chairman
California Natural Gasoline Assn.

"Ronnie" Heath got an early taste of the oil business working in the field during his school vacations. Being a native Californian and a graduate engineer of Stanford his interests have continued along the the technical lines of the Natural Gasoline Industry.

He joined the Signal Gasoline Company in 1923 which was operating one of the first gasoline absorption plants in California on Signal Hill and was the parent company of the present Signal Oil and Gas Company, with which he is still associated. Ronnie started in the laboratory, continuing as engineer, superintendent and as manager of the Gas Department.

Maintaining an active interest and membership in the C.N.G.A. since its inception, he has served on most of the committees, also as Vice-President in 1942 and President in 1943. As a member of the Executive Committee and Chairman of the Finance and Budget Committee, his past experience and advice is a big factor in the continued success of the Association.

Appointment of W. S. Rodgers, chairman of Texaco's board of directors, to a committee of business leaders to sponsor a countrywide Green Cross for safety movement, has been announced. The safety movement is fostered by the National Safety Council.

Melvin Burley has joined the drilling department of the Sunray Oil organization in the Santa Maria area. There were 23 wells producing when Sunray a couple of years ago acquired its Santa Maria properties; there are now more than 40 producing.

Brig. Gen. David N. Hausman, U. S. Army, retired, is the new president of Houdry Process Corp., Philadelphia. He succeeds Eugene J. Houdry, founder of the company. General Hausman also will be chairman of the board of Catalytic Construction Co., subsidiary of Houdry Process.

Ole Berg, Jr., widely known former major oil company executive in Los Angeles, has been appointed vice president and assistant to the president of British-American Oil Co. at Toronto, Canada. One of the youngest petroleum officials in the industry, Berg was born in San Francisco 44 years ago.

C. W. Coslow and M. M. Mautner have been elected to the board of directors of Plomb Tool Co. The board recently declared a dividend of 25 cents a share on the common stock, payable April 15 to stock of record March 31.

Frank Dyer, Jr., for the past 17 years a member of the investment firm of Revel Miller & Co., Los Angeles, has been elected a vice president of that organization in charge of the investment department.

G. Stewart Brown, manager of Standard of California's public relations department, and Stanton Smith, president of Smith Oil and Refining Co., of Rockford, Ill., are new members of the Oil Industry Information Committee.

Davison Named Vice President of Standard

Appointment of W. W. Davison as a vice president was announced recently by T. S. Petersen, President of Standard Oil Company of California. Davison has been general manager of Standard's El Segundo Refinery.

W. W. Davison

After graduation from the University of California in 1921, Davison joined Standard as a junior engineer. The following year he was made assistant chief engineer and the next year became a designs engineer. In 1928, he was assigned to the Manufacturing Department, where he served till 1936, when he was made refinery superintendent at the Standard Oil Company of British Columbia plant at Vancouver, B.C.

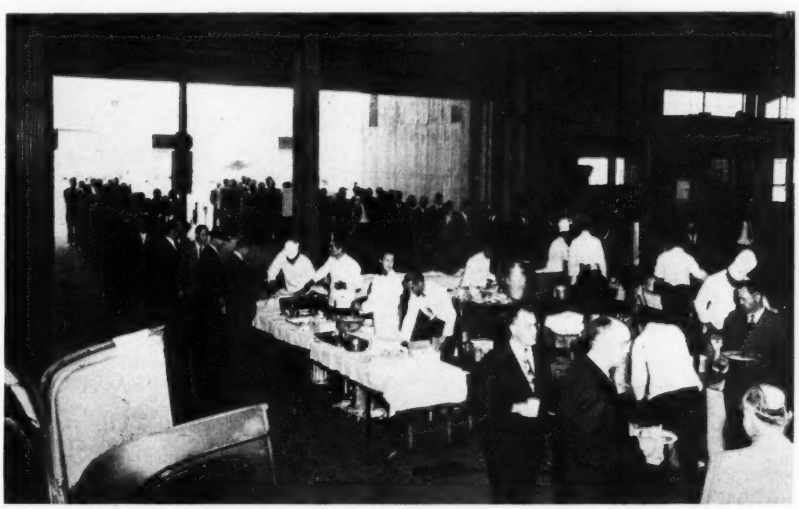
Four years later he became assistant superintendent at El Segundo and in 1944 was made manager.

Convert L. A. Office Into a Geological and Land Acquisition Office

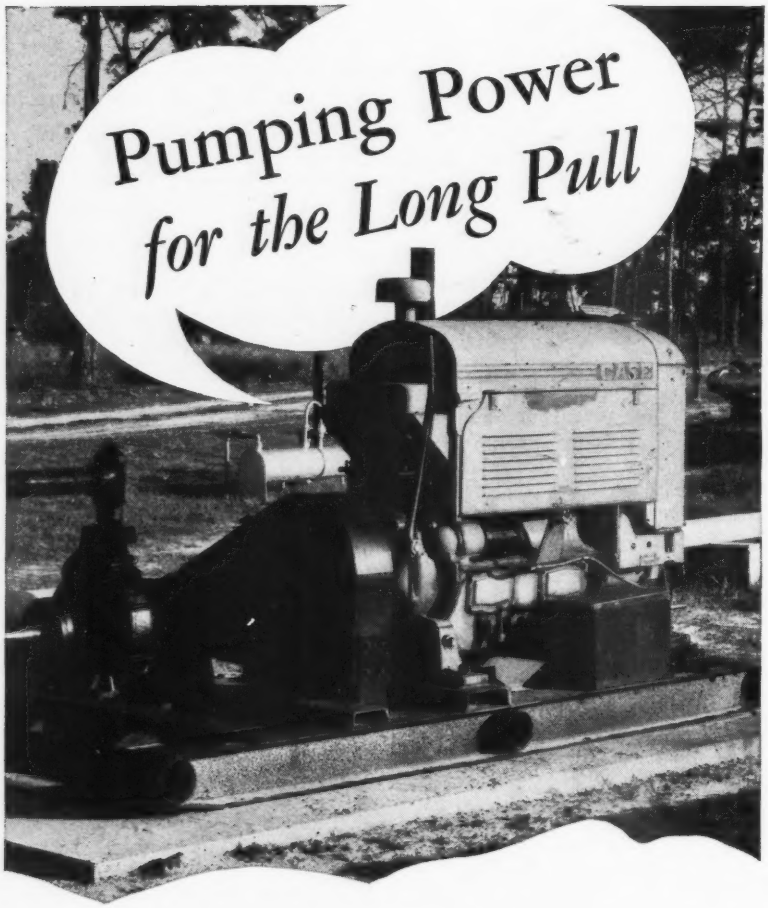
Honolulu Oil Corporation has recently converted its Los Angeles office, located in the Petroleum Building at 714 West Olympic Boulevard, Los Angeles, into a geological and land acquisition office, with Mr. W. L. Matjasic in charge. Mr. Matjasic was formerly situated in the Bakersfield geological office of the Company.

Mr. Howard Smith, who was formerly in charge of the Los Angeles office, has been transferred to the San Francisco office of the Company as head of the Land and Lease Department. Mr. Smith will retain his position as Vice President of Industrial Research Laboratories, Ltd., a wholly owned subsidiary of Honolulu Oil Corporation.

Robert F. Niven, secretary of Union Oil Co., will act as chairman of a $5,000,000 building campaign to expand Children's Hospital in Hollywood.



Pictured are some of the several hundred guests who attended the recent Open House of the Bethlehem Supply Company.



● You don't need to bother about the fine technical points of engines that have records of running non-stop for periods up to two years. Such a non-stop run means that every vital part has stood up, that every little part has done its duty without faltering or fussing. It's that kind of performance which has earned the respect of oil men for Case Oilfield Engines.

Case ENDURANCE enables them to run with a minimum of attendance. Fitted with cutouts that shut down on high temperature or low oil pressure, they are guarded from neglect. Faithful performance, consistent fuel economy, low annual upkeep, long working life — all told, they mean dependable pumping power at low overall cost.

3 SIZES . . Case Oilfield Engines are built in three sizes to cover a wide range of power needs at efficient load factor. They are the 28½ H.P. Model "SE," 42 H.P. Model "DE," and 61 H.P. "LAE." For full information and detailed specifications, call the distributor who maintains service in your area. J. I. Case Co., Racine, Wis.

CASE

Superior Oil's Howard Keck plans to enter his 60-foot yawl, Roland von Bremen, in the East's classic Bermuda race this year. The German-built yawl is a veteran of the 1935 Transatlantic race and she was also in the 660-mile Bermuda classic in 1938.

Her crew will include Bob Carlson, skipper; Keck, navigator; Clark Sweet, Kenny Watts, Dick Edwards, Bill Lapworth and Larry Doheny. An expected fleet of 40 boats will depart Newport, R. I., June 19 in the race.

Clyde A. Perkins, president of Perkins Oil Co., at Vancouver, Wash., is spending his annual vacation in Southern California. During his stay in Los Angeles, he visited H. C. Akerberg of Macmillan Petroleum Corp.

C. E. Finney, Jr., has been elevated to the presidency of the Salt Lake Refining Co. and the Salt Lake Pipe Line Co., subsidiaries of Standard of California. Mr. Finney, formerly a vice president of Standard, in his new position will direct the construction of both the Salt Lake projects. Each will cost about $5,000,000.

The regular meeting of the Petroleum Accountants Society at the Biltmore Hotel was enlightened by an address by R. P. Huggins, Western Gulf's vice president. His topic was "Problems in Joint Venture Accounting."

Triplet sons were born to Mr. and Mrs. Stephen William Gurasich, 2915 Magnolia Ave., Long Beach, on March 26th, in Harriman Jones Clinic Hospital, Long Beach. They are Stephen William Jr., 4 lbs. 9 oz.; William George, 3 lbs. 9 oz.; and John Francis, 3 lbs. 5 oz. The triplets have a sister, Joan, 14 months old. The triplets and mother are doing well.

Cleveland oil executive Ernest Byssche and Milton Barratt are spending a well-earned vacation in Colombia, South America. They are flying by plane on their South American sojourn.

Patterson-Ballagh Maps Coordinated Sales Strategy

During the past eighteen months many of the Oil Field Specialties manufactured by Patterson-Ballagh have been improved upon and new rubber products have developed. To give all of their salesmen the latest information on these changes and to show them new manufacturing techniques, the executives of Patterson-Ballagh arranged to have their domestic sales organization flown to the main office and plant in Los Angeles.

The recent three-day sales meeting included a comprehensive tour through the Patterson-Ballagh plant and a field trip to see new equipment being tested. The new manufacturing techniques and methods of manufacture were thoroughly explained. Each product was discussed from both the manufacturing and sales viewpoint. The salesmen made constructive suggestions which will prove valuable to the main office.

Executives of Patterson-Ballagh feel that this meeting was extremely successful in that their salesmen will now be better equipped to do a more thorough selling job in the field.

PATTERSON-BALLAGH LOS ANGELES SALES MEETING. Sitting: left to right, E. M. Rees, Export Manager; A. L. Gooden, Robert Cyphess, W. W. Simpson, T. M. Smith, Jr., Robert Kimball. Standing: left to right, Cliff Divelbiss, R. W. Shira, R. C. Medearis, W. B. Gardner, J. M. Newton, J. P. Magoffin, District Manager; J. B. Merritt, Assistant General Manager; H. H. Collins, Bill Bonner, Jr., A. G. Colgin, Jr.; A. O. Wells, W. E. Largey, Advertising Manager.

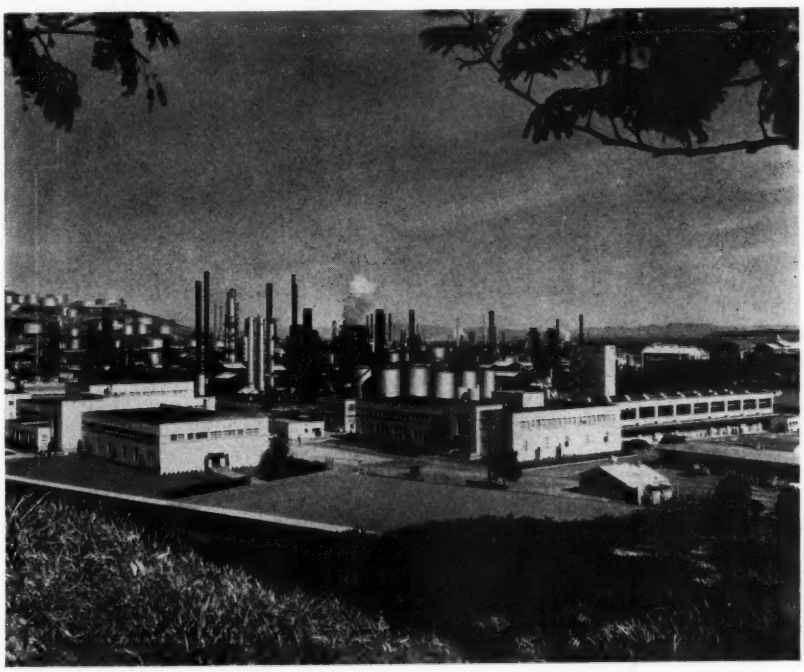
Ed Steele in Charge of Bakersfield Mud School

Ed Steele, Mud Engineer for Oil Base, Inc., makers of Black Magic oil base drilling fluid, has been appointed to supervise the mud school to be held in Bakersfield, California.

Held under the auspices of the American Association of Oilwell Drilling Contractors, classes began in March at Long Beach. Tentative plans call for similar schools in Bakersfield, Whittier, Ventura and Coalinga.

Ed Steele is an authority on drilling muds, having spent many years with Bell and Loffland as Chief Mud Engineer. He was California Sales Division Manager for Baroid Sales before taking over the San Joaquin Valley territory for Oil Base, Inc.

Hunter Atha, Pleasant, Mich., oil man, is a Los Angeles vacationist. During his visit in the Southland he is staying with his brother, George, prime developer at West Newport.



CALIFORNIA RESEARCH CORPORATION EXPANDS LABORATORIES IN RICHMOND

Panoramic view shows completed $2,000,000 laboratory program of California Research Corporation (a subsidiary of Standard of California) in Richmond, Calif., with Richmond refinery in background. The Cal Research buildings are, left to right:

Research Laboratory "A," which houses administrative offices and general laboratories;

Research Laboratory "C" (one-story building to rear of RL "A"), for industrial lubricant research;

Engine Laboratory "A," for testing engine lubricating oils;

Process Laboratory "A," which includes cold room and facilities for process research studies using pilot plants;

Process Laboratory "B" (seven-story structure in rear of PL "B"), for tall pilot plant operations.

Low buildings at extreme right are auxiliary process laboratory units.

THIS LAUGH

OFF!!

"What's the best way to preserve a wedding ring?"

"Dip it in dish water three times a day."

"What kind of a fellow is Paul?"

"Well, the other night the lights went out while he was sitting in the parlor with his girl and he spent the rest of the evening tinkering with the fuses."

Jury—Twelve men chosen to decide who has the better lawyer.

First Lunatic: "Betcha you can't climb up that beam of light that's shining in the window."

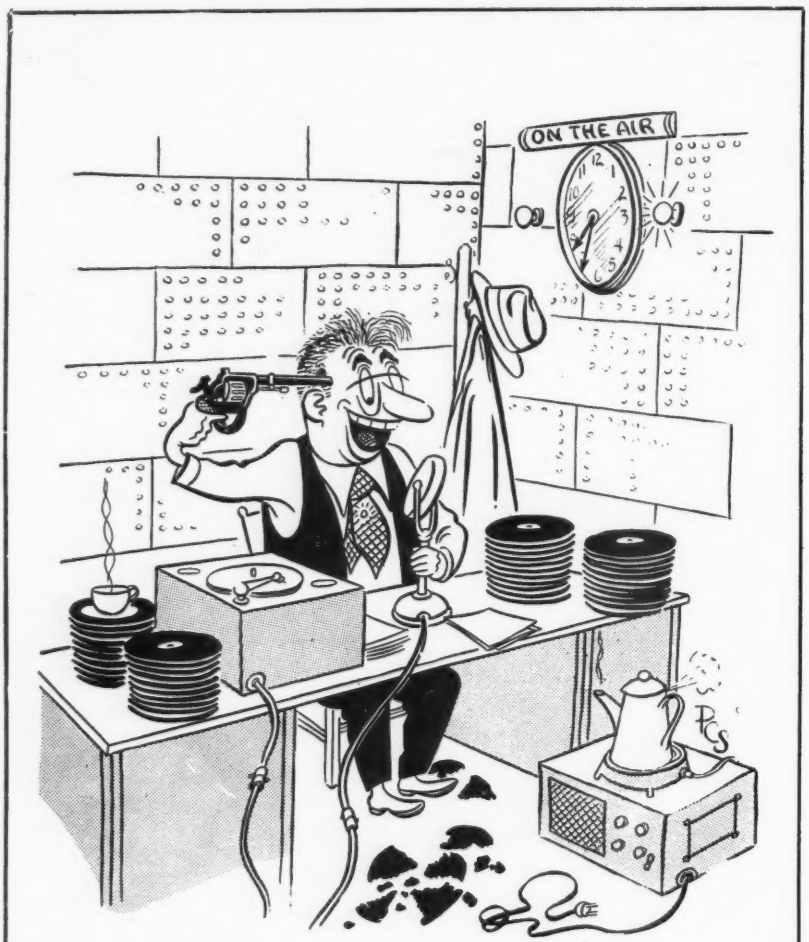
Second Lunatic: "Do you think I'm crazy? I'd get half way up and you'd turn it off."

A group of grade school children were asked the following question by their teacher: "If two automobiles were approaching from different angles, one traveling at forty miles an hour, and the other at sixty miles an hour, how old am I?"

After several minutes of meditation one small boy held up his hand and gave his answer as forty-two.

"How did you arrive at this answer?" asked the teacher.

"Well," said the small boy, "my brother is twenty-one and you are twice as crazy as he is."



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JENSENS Balance Any Well

Crank and beam weights and adjustable stroke lengths enable a Jensen to be easily and accurately balanced to meet any well condition. Along with roller bearings and precision machined and shaved gears, the flow of power is smooth—steady. Fuel consumption is lower, upkeep and maintenance costs are reduced.

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No question about it if you use Atlas B&B Knife TOOLS

The question of retarded production due to scale or accumulation of impervious material on well walls, liner walls, slots, or perforations is answered by the use of the Atlas B & B Knife Tool because of its simple and positive action. Our engineers will be glad to explain the Atlas B & B Knife Tool in every detail.

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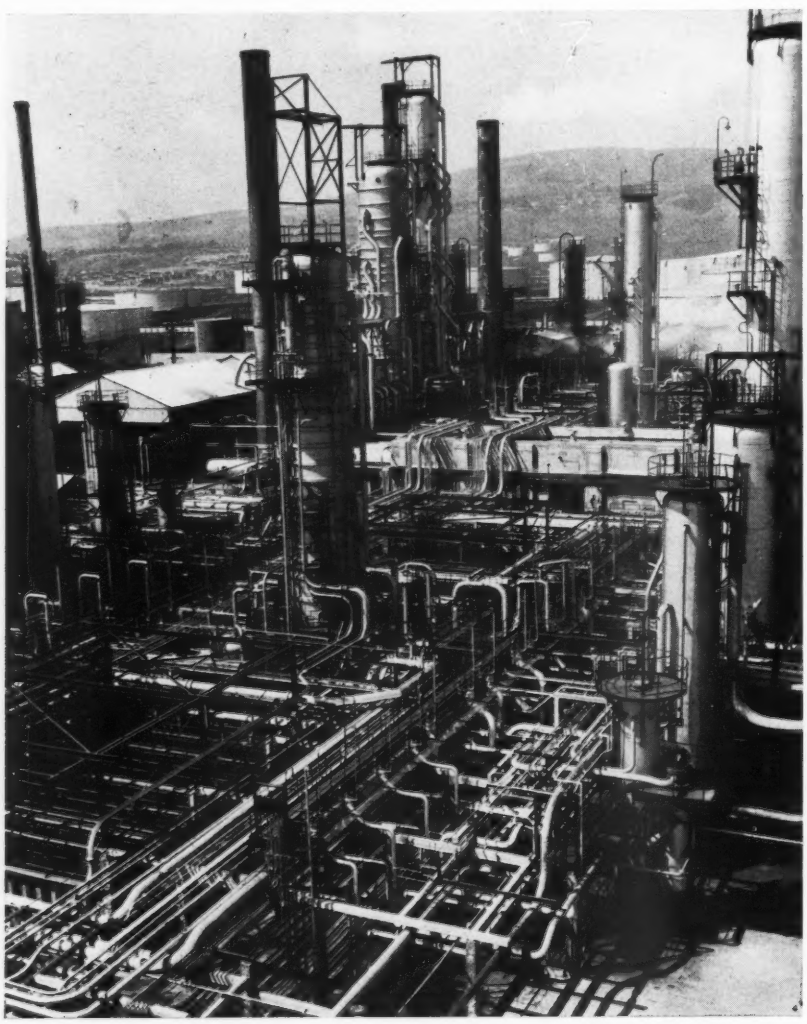
The Petroleum Industry of California

In attempting to evaluate editorially the California petroleum industry as it stands today, the greatest problem is not that of deciding what to discuss, but rather . . . what not to discuss. The ramifications of petroleum operation have so increased in the last decade that it would take reams and reams of copy to recite the interesting and exciting developments that have taken place. And California has in general been so "up front" in every innovation of consequence that it is hopeless trying to detail all her contributions here. We can only hope, therefore, to skim like a low flying plane, over the surface and take note of the accomplishment peaks here and there as they poke up above the less spectacular although perhaps just as significant feats that form the general level of advance.

Bill Boyd, perennial chief of A. P.I., said three years ago, "Fighting and winning two separate wars at the same time is a task that only a few years ago was simply beyond belief. Each of the wars which now engages our every effort makes World War I look like a skirmish. To appreciate the fact one only has to compare the number of our men under arms, the size of our navy, the strength of our air force, the cost to date, the distance to battle, and the starkly significant casualty lists, with the same facts of the last war. The comparison will disclose a trend that portends a world disaster so terrible as to be almost beyond comprehension if another world war comes. Savagery and slaughter will surely be brought to our own cities and villages if the four dread horsemen ride again.

"Indeed such might have been our experience in this war if the great oilfields of California and Texas, and the other oil producing areas of the nation had not existed to support our millions of warriors in the air, on the land and on the sea, and had not supplied the amazing flood of oil that has kept our mechanized might rolling steadily ahead. I find it especially gratifying that within only a few weeks I have had the opportunity to visit our two greatest oil producing states, viz. California and Texas . . ." It is to be noted that, while Mr. Boyd, later apologized to the other producing states for mentioning only California and Texas by name, he must have felt pretty much impressed by the performance of these two to name them at the risk of displeasing the rest. And, the thing that we wish to emphasize here is that he must have been really excited about California's part when he mentioned the Golden State ahead of Texas.

Be all that as it may, we venture to suggest that while the late war did a great deal to focus the attention of the world on the efficiency and competency of the California petroleum industry, it was merely a fortuitous disclosure of something that had been evident to studious deservers for a long time. California is to the rest of the states of the Union, much as the United States itself is to the other countries of the world. It is the youngest of all the states, and its people are the most daring. It was the adventurous spirit that brought our forebears here to begin with, and

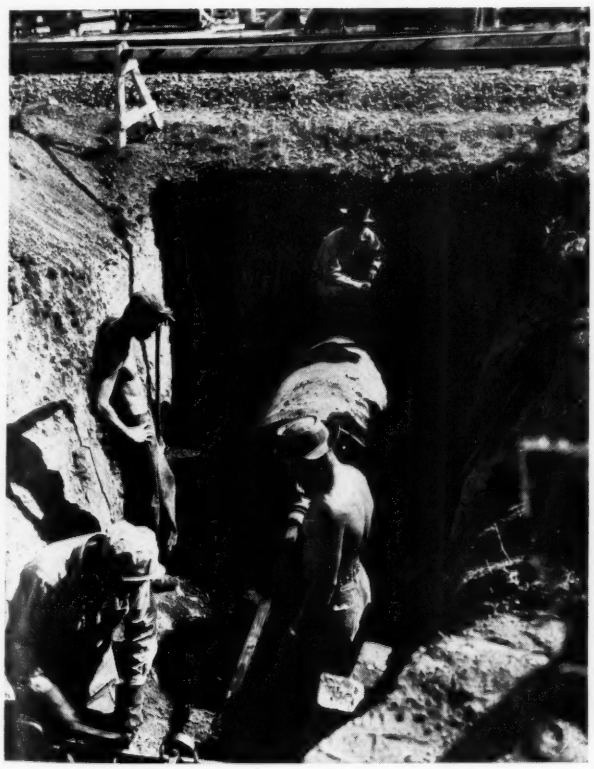


That there is nothing picayunish about California plants is evident in this interesting view of some of the piping in Union Oil Company's refinery at Wilmington. This formidable array is just a small corner of the complete refinery, but it is sufficient to give an idea of the general overall size.

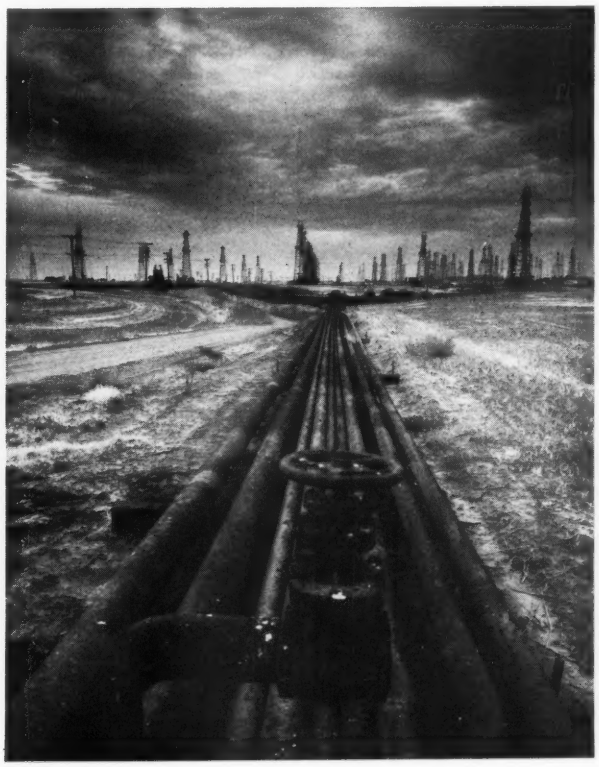
not so long ago that we have lost to any great extent the exploratory urge that brought them. In consequence, we say, modestly of course, that in all species of free enterprise out here there is a sort of industrial excitement that is lacking in more settled areas. It is very noticeable in the oil industry, for over the years since operations first began to be commercially productive in California, the pace of technological advance has been rapid. And just so that our friends in Texas and the other oil producing states won't feel too badly, it must be admitted that many of our most prolific idea men have come from these distant states, and under the stimulas of the restless spirit of the West have risen to high levels of achievement.

Looking at the California industry objectively and with some degree of orderly sequence, let us first dwell on the exploration sciences as they are practised here. It is claimed, and we believe with some justification, that petroleum geology had its birth in the West, and if that isn't altogether true, it was certainly a very small baby when it was first adopted by far western operators, and nurtured to its present greatness. Under the head of geology, come these supplementary finding sciences . . . micropaleontology, geophysics, geo chemistry, geo biology, and a raft of more or less related agencies and devices, all of which have been utilized to the highest possible advantage by the California industry, which is nothing if it is not scientific. We have stated that some of the earliest attempts to correlate geological findings with the sub-surface presence of oil were conducted in the State. By the same token micropaleontology, if it did not have its beginning here, was given the industrial support and attention that was necessary to its adequate development. The seismographic method of sub-surface correlation is attributed to De Golyer, but again it must be admitted that Western operators were sufficiently alive to grasp it while it was still tottering on shaky feet, and help it to grow into major consequence as a finding medium.

It might further be noted as an indication of Western foresight that, particularly in the realm of geophysics, some pertinent devices of excellent quality have been perfected here and are now being manufactured on the Pacific Coast. And, certainly, there is no phase of the exploration business that has not been definitely advanced by the continuous research efforts of the alert group of operators who constitute the California petroleum industry. It is interesting in this connection, too, that it was intense study of geo chemical methods that led to the development of the mass spectrometer . . . now used in many industries, and an almost indispensable item of laboratory equipment both for the conduct of refinery



California is not only the western terminus, but the 30-inch pipe for the western section was fabricated in Los Angeles by the Consolidated Steel Corporation, starting from scratch, and so successfully completed that shortly orders were forthcoming for other parts of the line, and for an even larger diameter line for the Trans-Arabian system.



An interesting view of Union Oil Company's Callender lease at Dominguez, California.. The Company originally discovered this field and has developed it along most scientific lines. It was here that some of the early testing of gas lift was done, and when proved to be sound, was instituted.

Lufkin PUMPING

A heavy duty, medium speed engine, designed for minimum maintenance, compactness, accessibility and ease of installation to meet oil field requirements.

COOPER BESSEMER ENGINES . . . .

Supplied as a complete power unit complete with operating accessories including clutch. It may furnished less clutch for pump or generator dr

Typical installation — G S D H horizontal gas engine 40-60 H.P., two cylinder, two cycle, 400-600 R.P.M.

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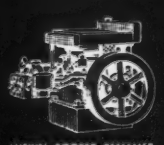
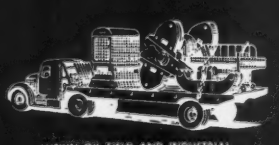
LUFKIN PUMPING UNITS



LUFKIN-COOPER-BESSEMER ENGINES



LUFKIN OIL FIELD AND INDUSTRIAL TRUCK TRAILERS

INDUSTRIAL SPEED REDUCERS AND INCREASERS

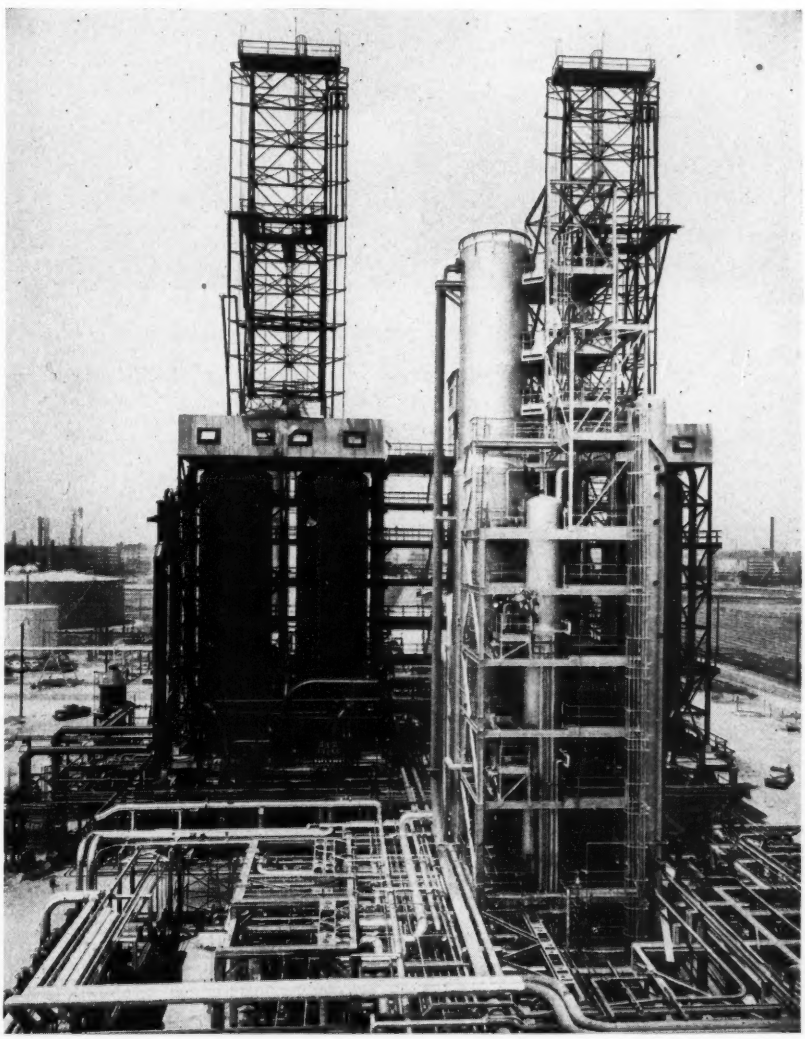
DIVISION LUFKIN FOUNDRY & MACHINE COMPANY INDUSTRIAL, MILL AND AUTOMOTIVE SUPPLIES

control tests and for the prosecution of hydrocarbon research. The mass spectrometer was first projected to aid in the search for petroleum by analyzing soil gases, particularly to determine the presence of very low concentration of hydrocarbon gases. In its experimental stages during war times, however, it became obvious that it was suited to more urgent functions in connection with the manufacture of high octane gasoline. The first effective machine, and most of the subsequent improvements were engineered by a group of young West Coast scientists, who have since manufactured instruments for petroleum laboratories . . . control and research, all over the country.

In the realm of micro-biology, and its relation to the origin accumulation, and migration, of petroleum, in which some remarkable work has been done during the past few years, it might be remarked that the entire program with all its involvements is handled from the Scripps Institution of Oceanography of the University of California, La Jolla, California. There the researches of Dr. Zobell and his associates have been creating industry wide excitement. They have discovered that living bacteria are widely distributed in sedimentary material, and that such bacteria have the ability to bring about changes in the chemical composition and physico-chemical conditions of recent sediments. They report the bacterial production of various hydrogen-producing bacteria may be responsible for the hydrogenation of organic matter. Actually the laboratory experiments indicate that bacteria can release oil from oil bearing sediments by dissolving calcareous material, by crowding the oil off physically, and by producing surface-active substances. Carbon dioxide produced by the bacteria and the increased porosity resulting from the solution of the calcareous matrix both aid the flow of oil.

These researchers point out that while the experiments so far conducted are inclined to promote some optimism, the bacterial method of producing oil has not yet reached a commercially feasible stage. Each oil bearing formation must be individually diagnosed bacteriologically as to temperature, salinity, organic content, and other pertinent factors which might affect the bacterial strain to be introduced. Polyvalent strains have not been perfected yet, and no one has cultures for sale, but the entire program constitutes a highly interesting departure in microbiological research that is certain to lead to very definite information on the genesis of petroleum, and may even develop a method of producing it where prevailing methods are inadequate. That, however, is all in the future, and it is well to remember now that there are lots of bacteria which are harmful to oil wells, so it is distinctly advisable to leave this study to the experts until it has been a trifle farther advanced. Meantime, there is no question of the potential significance of the research, and the fact that it has had its seat in California is just another indication that the local oil industry has fully matured.

The result of all this advancement of exploration instrument and method is not noticeable on the surface. According to the reserves committee of the A.P.I., the estimated proved reserves in California as of December 31st, 1946, were 3,293,-491,000 barrels, but production during the year 1947 almost equalled the added reserves due to extens-



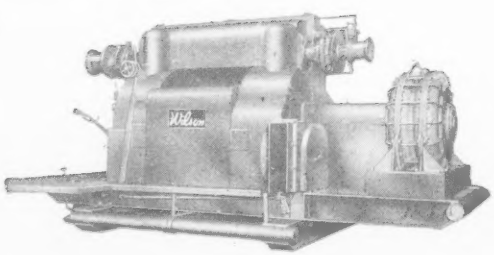
General Petroleum Corporation's delayed recycle coking plant at Torrance, California. This is a view of two coke drums, with equipment for decoking the distillation columns. This is another comparatively recent advance in refining method.

"After more than two years of continuous operation, the satisfactory performance and low maintenance keeps us smiling and happy with our

Wilson RIGS"

C. A. McDaniel
E. L. Chilton

The men who really know – owners and operators such as C. A. McDaniel and E. L. Chilton of McDaniel and Beecherl – give final proof that Wilson Rigs do the job right. And the 1948 Wilsons are even greater, with almost 40 improvements including the Air-Tube Disc Clutch, compact and trouble-free with tremendous capacity . . . Coupling Clutch Pump Drive which works without wear . . . Traveling Block Safety Stop . . . Automatic Speed Change . . . and many others to make your drilling operations easier and more profitable. Wilson, the most copied rig in the world, again sets the pace.



WILSON TITAN MODEL POWER RIG with a rated capacity of 12,500′ using 4½″ drill pipe or 15,000′ using 3½″ drill pipe. In several instances, Wilson Titans have exceeded the rated depth of 15,000′ without undue strain or damage.

Complete descriptions and specifications of all rigs and winches are included in the Wilson Silver Anniversary Catalog. Write for your copy today.

POWER RIG & EQUIPMENT CO., INC.

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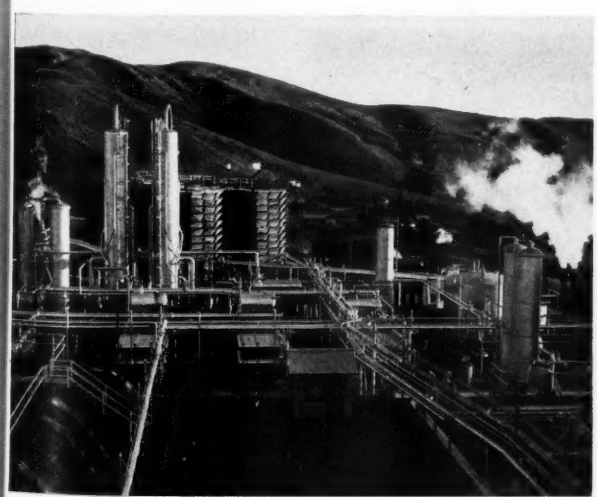
FORMERLY THE H & B SALES COMPANY, LTD.

ions, new pools, etc., so that we ended up with very little difference in proved reserves. As of December 31st, 1947, they stood at 3,294,963,000 barrels. While discoveries were small, however, it must be remembered that like all other producing areas, California was hampered in her search by lack of steel and divers contingencies that held the entire country down to a total increase of 614,125,000 barrels of new reserves. The industry is raring to go, however, and when and if materials and supplies do become available again, it is certain that the State is due for such a going over by the oil explorers as it has never had since Professor Silliman rounded the Horn.

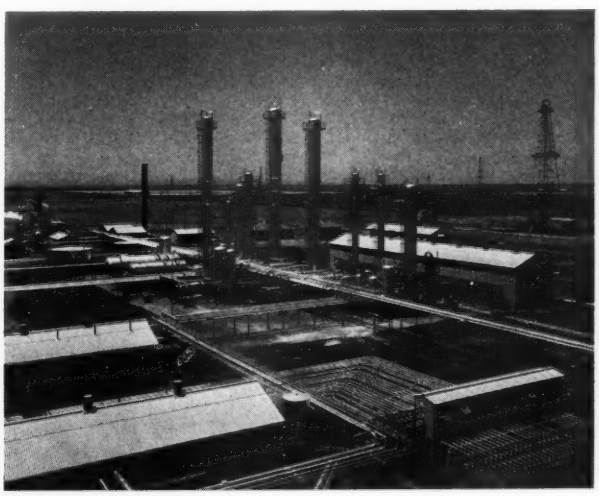
Just as California has always been in the forefront of the exploration picture, so also has she acquitted herself nobly in the matter of production . . . a little too nobly, perhaps for her own good. It would be unpatriotic, we suppose, to scream about our contribution to the war effort, but there is no question that our home reserves were badly hit during the war period. When the demand was at its height, California was asked to increase its daily production to a million barrels . . . an increase of approximately 45 per cent over prewar level, at a time when the national increase averaged about 26 per cent. Of course, ours was the ideal area from which to oil the Pacific war and no one will deny that we did our bit well. That is another bit of evidence that California Oil World has long contended, to wit: When an emergency arises, the petroleum industry can be depended upon to do the greatest possible good with the least possible disturbance. It is true of California oil operators, as it no doubt is of all operators generally, that they always have the next few years planned. Trained petroleum economists, and we have some good ones on the Pacific Coast, are able by analysis of existing facts and conditions, to predict future trends. Simultaneously our research departments are always out in front of prevailing products and processes, and, thus, when the unexpected happens and a sudden spurt is required in our evolution, the matter of adjustment is comparatively simple, and can usually be speedily contrived. It is doubtful, for example, if any industry was so easily adjusted to the stupendous needs of the war as was the petroleum industry, and it is certain that no part of the petroleum industry was able to accomplish the change and speed—up any more easily or smoothly than did California.

According to the record, there were 1554 wells completed in California last year, and there is every indication that, despite shortages and other difficulties, we may beat that mark this year. The State Division of Oil & Gas for April 10, 1948, gives a total of new wells for the year to date as 748 as compared to 566 for the same period in 1947. As we have tried to stress throughout this dissertation, however, there is a factor in our picture that is difficult to evaluate. That is, industrial persistence coupled with what the operators like to call the "know how." It is an unfortunate fact that all projections have to be based on prevailing rates of supply and demand, and existing methods of operation, whereas in actuality when demand tends to exceed supply, ingenuity is whetted, producing tools and techniques are improved, and yield is automatically increased. In this respect the Western operator has not lagged, either. Highly important changes in drilling engines and their appurtenant machines and devices have had their origin in the oil fields and manufacturing plants of the Pacific.

An example of this is the recent development of a twin-masted derrick, with drawworks below floor level, a pipe rack that is based on the



Natural gasoline is finding its place in the California sun since it became recognized that from the natural gas plants can be derived some highly important constitutents for the manufacture of high octane gasoline.. This is a fully modern unit operated by the Shell Oil Company at Ventura, California.

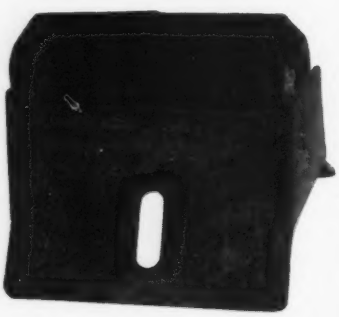


Paloma Cycling Plant, Paloma, California. This plant is part of a unitized system, operated under the control of an operating committee representing all the property holders in the Paloma field. It is a classical example of what can be done under a rational type of operation.

ONE STRIKE and you are OUT!

unless your Traveling Block and Rig is PROTECTED

with a Patterson-Ballagh Traveling Block Bumper



A Traveling Block Bumper, which was run into the crown. Only the Bumper rubbers are broken. Neither crown or traveling block suffered damage. Here is an item that cost about $300 and saved many thousands in lost time and replacement of damaged equipment. All that had to be replaced were two inexpensive Bumper Refill Rubbers.

A "BOBWHITE" Bumper on an Owsco 66"-5 Block

YES, you are out both time and money if your unprotected Traveling Block ever smashes into the crown. Records show that they are run into the crown... once in a while. If it's only once in the lifetime of a rig, the time lost and the cost of repairs may spell the difference between profit and loss. A Patterson-Ballagh Traveling Block Bumper installed on your rig is the wide margin of safety that may keep you from putting out money for costly repairs and save you valuable drilling time.

With the skill and teamwork of drilling crews, it seems impossible that the Traveling Block would ever crash into the crown, but when over 100 tons of block and pipe are speeding toward the crown in the pitch black of night and the lights on the derrick are playing tricks with distance, a split-second difference in timing will mean that the block will crash into the crown. *Don't* let a *strike* like that put you *out* of the money.

There are 58 individually designed Patterson-Ballagh Traveling Block Bumpers that will fit most standard three to six sheave blocks. If you use a Regan, Nasco-Ideal, Emsco, Owsco, Ideco, Wheland-Lucy, Baash-Ross, Brewster, Bethlehem, Beaumont, or McKissick Traveling Block, your Bumper can be installed quickly and securely on its top. There, the large rubber cylinders soften and absorb the shock of accidental crashes with the crown. See pages 3464 and 3465 of the 1948 Composite Catalog for complete information and then order a "Protection Proven" Patterson-Ballagh Traveling Block Bumper for your rig today!

PATTERSON BALLAGH · SEAL OF QUALITY · OIL FIELD SPECIALTIES ·

Specify "PROTECTION PROVEN"

PATTERSON-BALLAGH

DIVISION OF BYRON JACKSON CO.

TRAVELING BLOCK BUMPERS

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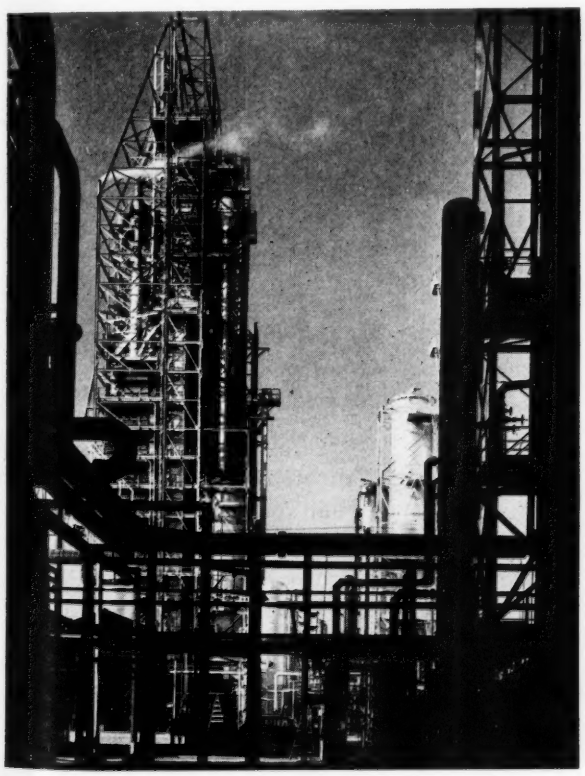
T.I.P.S.A., Santiago Del Estero 286; Buenos Aires, Argentina ★ H. F. Towler, 9 Cavendish Square; London, W1, England

ground . . . taking more of the load off the floor, and a console at which almost the entire gamut of drilling operations can be controlled by a series of push buttons. It is contended at least that one of California's best known pioneers was the originator of well cementing, and whether or not this is true, a great deal of worthwhile progress has been made through the work of local operators in assuring the more accurate placing of the cement, and reducing the amount of work and time involved in cement jobs. In Western shops and fields the whole cementing problem has been subjected to constant study by petroleum engineers, equipment designers and others concerned. With more accurate placement and more precise measurement of the annulus, that phase of the problem has been largely simplified. Then, of course, the invention of multistage cementing has expedited the process considerably . . . since the successive stages are completed without the necessity of coming out of the hole.

Muds . . . both oil and water base, plastics and stabilizers, additives, and conditioners of all sorts have been the subject of intense study by California oil and equipment companies, and by individuals and groups, technically equipped to conduct such studies effectively. This has led to a better understanding of the essential characteristics of drilling muds for a wide variety of conditions, and the effects of extraneous agents and reagents on these characteristics. Treatment of made-up water for drilling mud has been a topic of intense study both in the laboratory and the field by local operators, and scratchers have been developed to keep the sand face free from mud and so provide a better bond between the cement and the sand, in the interval that is being cemented off.

Oil well surveying, which in turn has pointed the way to controlled vertical and controlled directional drilling, has found extensive application in California, and has been improved in many ways as a result of the concerted effort of petroleum operators and equipment design engineers. Long Beach, now claimed to be the richest oil town in America, makes necessary the copious use of surveying instruments and processes by any operating company with a drilling lease on certain of its city properties. Much of the producing formation lies under rich residential areas, and with the permission of the residents and the city itself, an agreement may be instituted under which an operator can drill on some unrestricted nearby property, and then whipstock over at a stipulated depth to the producing area. This type of operation, also carried on in many other localities in California has developed a drilling expertness that keeps our operators right on their toes. It has also stimulated the design and manufacture of a number of accessory instruments and machines that have become im-



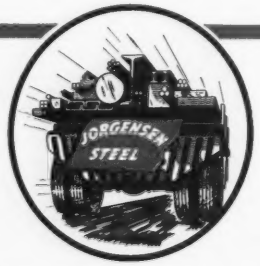
One of twin Thermofor Catalytic Crackers in General Petroleum Corporation's very up-to-the-minute refinery at Torrance, California. The complete installation is believed to be the largest of its kind in the world.

The richest oil town in the United states is said to be Long Beach, California, and it derives most of its revenue from the oil operations that go on inside its limits. This is the General Petroleum Corporation's Southern Pacific lease. Note the gas traps and crude oil scrubber tank inside retaining wall, to obviate fire spread in producing area.

Steel Problems?

Call Jorgensen First

IT'S a wise bird who calls Jorgensen first. And that is the way you, too, can have that feeling of security which comes from knowing you will have the right steel at the right time at the right place. Jorgensen is *really* equipped for steel service. Large and diversified stocks of carbon, alloy, stainless, tool and specialty steels. Modern handling, cutting and delivery equipment—plus an organization skilled in solving steel problems. For Steel—*CALL JORGENSEN FIRST!*



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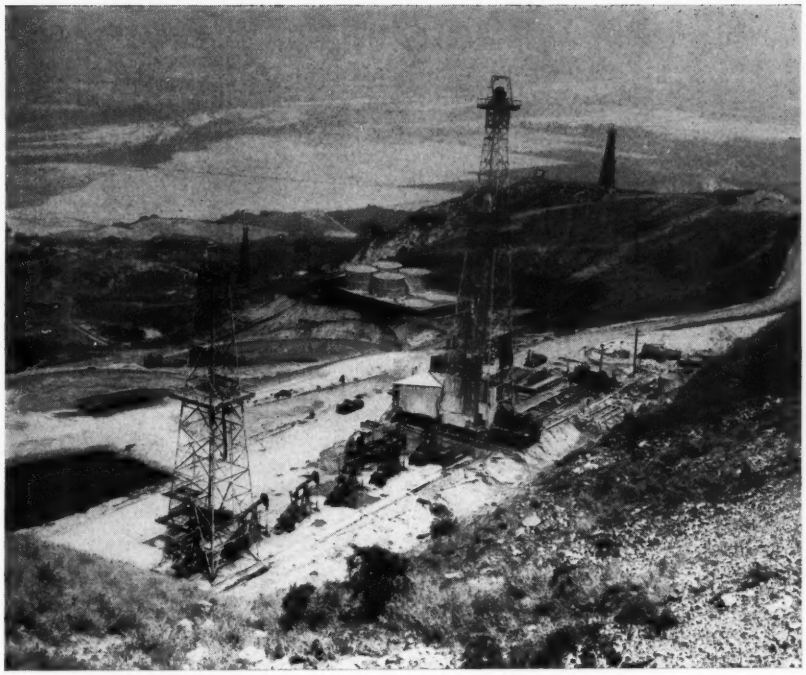
portant in modern drilling techniques.

In the gradually increasing depth of present day wells, California has definitely played a leading role, and in consequence its shops have been occupied with the incidental problems that greater depths impose. More powerful hoisting engines, and more smooth control of brake mechanisms have been built into the most recent rigs. Indeed, there is scarcely an item in the extensive list of machines and supplies that constitute a drilling rig that cannot be found in some forward stage of development in the factories and laboratories of the West. Portable rigs of all kinds are being fabricated locally, both for home and foreign use, and they incorporate every modern improvement . . . the entire package being specifically designed to expedite the drilling process, and lower the footage cost.

In the production phase of operation the same ceaseless advance is evident. It is doubtful perhaps if we have reached the technological aptitude of our eastern brothers in secondary recovery, but we certainly were among the pioneers in gas lift, sub-surface storage, and other somewhat radical departures from the mode at the time of their introduction. Nor are we lagging in the design and manufacture of pumps, steam, internal-combustion driven, electric, and hydraulic. Indeed, it might be safely concluded that in every aspect of field work, the western operator is thoroughly apprised of the last word in technique, and the western manufacturer is equally well informed on the needs from a mechanical viewpoint. The splendid cooperative understanding that exists between these two has been responsible in no small way for the consistent progress that the California oil industry has enjoyed over the years.

Natural gas production in California during 1947, including both oil well gas and that produced dry, amounted to 694,163 million cubic feet of which 125,000 million cubic feet were returned to formation, and some 555,839 million cubic feet were sold. During the same year, the Biggest Inch (30 inches at California end) pipe line was completed. This was designed to bring 305 million cubic feet daily to the metropolitan area of Los Angeles from Texas; and will assure Southern California of an adequate supply (including its own production) for the next 30 years. There were recovered in its processing plants during the year 2,934,000 gallons daily of natural gasoline and allied products. This was a substantial increase over the preceding year, and rates the State as second only to Texas as to rate of increase and total production of natural gasoline. As in all other producing areas, the sale of Liquid Petroleum Gases continues to rise rapidly in California, and the natural gasoline industry is in a very healthy condition.



Another insight into The Texas Company's operations in South Mountain. This one is especially designed to illustrate the modern method of using successive well locations, simply skidding the rig over after each completion. Note that there are five wells pumping and one drilling.

Of special interest in this connection is the Paloma Cycling Plant, completed in the middle of 1944, and still doing everything it was expected to do. This plant is operated by Western Gulf Oil Company, under the supervision of an operating committee, representing the participating companies . . . Western Gulf Oil Co., the Ohio Oil Co., The Texas Company, Barnsdall Oil Company, General Petroleum Corporation, and Union Oil Company of California. It was designed to handle some 50,000 m.c.f. of gas per day, and has proved very completely the advantages of unitized operation. The entire project has been carried along in an orderly, efficient manner, and has shown very definitely that understanding people can get together and can pool their interests and capacities, and do a better job for all concerned. Another example of this cooperative planning and operation is the South Coles Levee plant which has been conducted in a very similar manner, and with similarly satisfactory results.

Looking at California's refining facilities, it is hard to believe that any area could be better equipped to carry the refining of petroleum to its ultimate ramification. During the war over $100,000,000 were spent in Southern California for additional facilities for the manufacture of 100-Octane gasoline alone, millions more were spent for other modernization measures, and since the con-

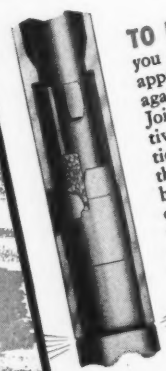
NEW

The SHAFFER-WAGGENER BUMPER SAFETY JOINT

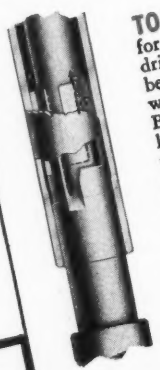
Jars automatically-and repeatedly!

Foolproof release whenever desired!

Here's something completely new that has already proven itself on one deep well after another—the Shaffer-Waggener Bumper Safety Joint. It combines in *one* tool the *two* most effective methods of protecting against stuck pipe . . . a rigid, wobble-free drive down Bumper Sub that can be run in the drill string for jarring through formation bridges, tight spots, and freeing "balled-up" bits or driving out of key seats when coming out of the hole—plus a foolproof Safety Joint that assures quick release from drill collars that have become hopelessly stuck. What's more, as a Bumper Sub it operates *automatically* . . . and as a Safety Joint it is the *strongest*—not the weakest—joint in the string. *There's nothing else like it for all-around safety and dependability!*



TO USE AS A BUMPER SUB you need only slack the weight of approximately 2000 ft. of drill string against the top of the Bumper Safety Joint. This weight actuates a positive trip mechanism which automatically releases, allows the weight of the pipe to strike a sharp downward blow, and then the tool automatically resets itself for another blow as the pipe is raised. Blows can be struck repeatedly and continuously by simply raising and lowering the drill string, thus permitting prolonged jarring as long as necessary to free the string.



TO USE AS A SAFETY JOINT for quick, positive release from stuck drill collars in the event they cannot be loosened, you simply slack the weight of the string to trip the Bumper Safety Joint and then apply left torque and slightly raise the tool to release. The slight reverse torque rotates the drive keys into an unlocking slot similar to a "J" tool. Then, by simply lifting the string, complete release from the stuck portion of the drill string is effected. The mandrel remaining in the hole is of smaller diameter than the drill collars, thus facilitating fishing operations in tight holes.

Advantages as a BUMPER SUB

- The Shaffer-Waggener Bumper Safety Joint remains in locked position at all times until the required tripping weight is placed on it. Therefore, there is no "working" of the joint during normal drilling operations—hence, no wear on the tool, its packing or parts.
- The Bumper Safety Joint is an *automatic* Bumper Sub—it jars automatically, and re-sets automatically by simply raising and lowering the drill string. No complicated drill string manipulations are necessary.
- When pipe becomes stuck, the definite tripping action of the Bumper Safety Joint gives positive indication as to whether the string is stuck above or below the tool, thus saving vital time in proceeding with recovery operations.

Advantages as a SAFETY JOINT

- Because of its unique and positive releasing design, which does not require back torque, the Bumper Safety Joint is the *strongest* joint in the string—not the weakest, as in all other conventional Safety Joints. Therefore, it is equally efficient for *both* right and left rotation during all drilling operations.
- Complete release from stuck portion of drill string is effected *only* by tripping the tool and then applying reverse torque combined with upward movement. There is no danger of the tool releasing during jarring or drilling operations!
- The Shaffer-Waggener Bumper Safety Joint is packed with chevron-type asbestos packing adequate to withstand any known bottom hole temperature—and adequate to insure leakproof operation under continuous high circulation pressures.

AVAILABLE IN ALL SIZES...

The Shaffer-Waggener Bumper Safety Joint is available in a wide range of sizes for use with all commonly-used drill strings. In each size the amount of weight necessary to operate the tool equals approximately the weight of 2000 ft. of the corresponding size of drill pipe.

SHAFFER

HIGH PRESSURE DRILLING AND CONTROL EQUIPMENT • FISHING TOOLS THAT EXCEL

SHAFFER TOOL WORKS, Brea, California • California Service Shops: Santa Fe Springs and Taft
HOUSTON, TEXAS, 6006 Navigation Blvd. • ODESSA, TEXAS, 1925 West Second Street
OKLAHOMA CITY, OKLAHOMA, Acme Oil Tool Company, 1001 S. E. 29th Street
EXPORT SALES OFFICE: Shaffer Tool Works, 30 Rockefeller Plaza, New York, N. Y., U. S. A.

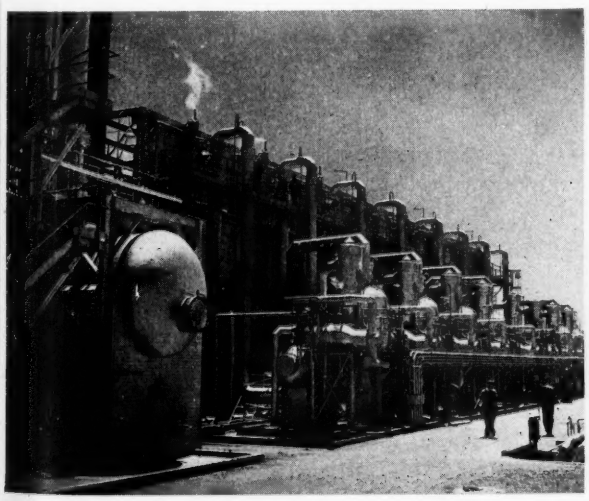
clusion of the war, the spending has continued almost without abatement. As has been already intimated, the petroleum industry in general was well aware before the war broke out exactly what it would be required to do if United States ever became involved, and it's a fact that some of the large catalytic cracking units were materialized right from the drafting table to the refinery. There was no time to waste building pilot plants and testing out a program that was too urgent to wait. California played a distinctive part in the war effort, and has not relaxed one iota in the meantime.

Among some of the most interesting local refinery developments are the installation of plants for the manufacture of phthalic anhydride, used in the compounding of glyptal resins. The anhydride is made from ortho-xylene, a product of petroleum, derived by modern methods, and the glyptal resins are in wide use throughout industry, particularly as protective coatings on motor windings and in many other places as guards against the effect of moisture and other corrosive agents, to which they are almost completely resistant. Another interesting and somewhat recent refinery development that had its birth in California is hypersorption, an unusually selective method of fractionating light hydrocarbon components. It is based on the ability of activated carbon to adsorb the less volatile constituents in a hydrocarbon gas mixture while the light ones pass on through. In the refining process, a moving bed of activated carbon contacts the feed gas, thus adsorbing and fractionating the mixture. The adsorbed material can then be selectively released from the carbon. This method has proved a very useful one in a number of hitherto difficult separations.

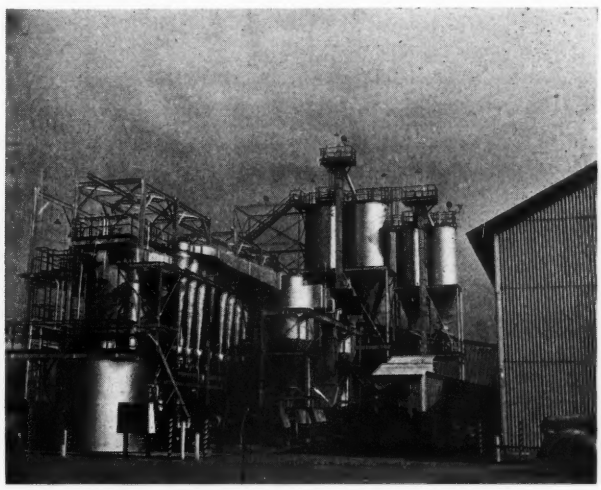
Significant of the industry's trend toward the manufacture of chemicals from petroleum is a new isopropyl alcohol and secondary gutyl alcohol plant at Dominguez. Then there are new units for making detergents, and organic chemicals of endless variety at Richmond, Martinez, Los Angeles, and other strategic points throughout the State. And, in discussing, the new phases of industrial operation that spring directly from petroleum, we should not overlook the manufacture of iodine from oil well waters, begun about a decade ago at Dominguez, Long Beach and other local producing points. Also marking a most important trend in petroleum product derivation and manufacture is the growing production of materials for the use of ranchers and orchardists. It is safe to say that the California oil industry has been a leader in many types of research related to agriculture, and is now producing an extensive array of insecticides, funicides, growth inhibitors, food nutrients, soil enrichers, and all sorts of aids that are of inestimable benefit to the growers, and to the economy of the country.

California's research effort is no new thing. It started almost the same day as the industry, and has made prodigious strides in the meantime. It has reached such tremendous proportions indeed, and has so broadened in scope, that it has become necessary to break it down into departments . . . each concerned with a specific type of research only. In turn these departments have become so large, in function, at least, that they have been made into subsidiaries, with their own executive officers and board of directors, tied in to the parent company somewhat remotely, so that there is no interference with the creative urge by which they are impelled ever forward.

So far the California program seems to be broken up into about five different categories: Product



Another interesting innovation of comparatively recent vintage is this phthalic anhydride plant at Standard's Richmond refinery. The base material is ortho-xylene, made from petroleum. The final product is principally used in the manufacture of the so-called glyptal resins, which have wide use in industry. The original discovery of the process was made by California Research Corporation.

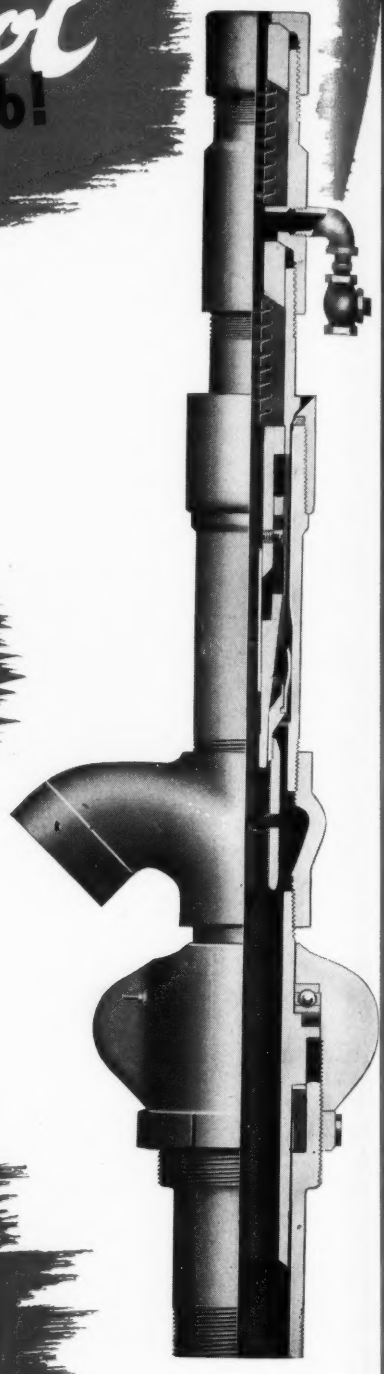


A comparatively recent development in California is this detergent drying plant at Standard's Richmond refinery. The detergent was discovered by California Research Corporation and is now marketed through the Oronite Chemical Company. The basic raw material used in synthesizing the detergent is alkane derived from petroleum.

ONE PRESSURE CONTROL

Pressure Control

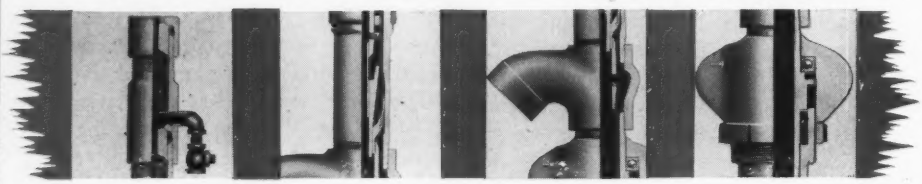
useful for every wire line job!



HERE'S the tool that gives you all the advantages of a poor-boy swivel for rotating pipe and circulating to keep the well under control . . . and on top of that gives a pressure-proof wire line pack-off to hold gas and oil inside the flow lines. IT'S THE BOWEN PRESSURE CONTROL!

With this one compact unit you can run wire line core barrels and surveying instruments under pressure—WITH SAFETY—swab for production tests, keep the pipe free, maintain circulation and have a dry and SAFE rig floor. You have in one tool all the safety and operating convenience you normally get only by combining several individual tools!

4 RUGGED PARTS INSURE *Complete Control*



1 2 3 4

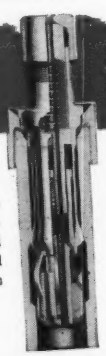
1. This PACKING UNIT on the Bowen Pressure Control prevents gas or fluid leakage and wipes the line clean as a whistle. It automatically locks in position when tools are lowered in the hole, and automatically releases when struck by outcoming tools.

2. See that AUTOMATIC LOCK? It snaps into position as the tools are lowered, AND NO AMOUNT OF PRESSURE CAN BLOW IT OUT. Yet when struck by the rope socket it releases the packing unit INSTANTLY. Eliminates need for flagging the line—speeds your operations.

3. With this GOOSENECK CONNECTION, you can attach the regular rotary hose and keep up circulation to prevent pipe sticking. Takes any pressure you need for control, and doesn't choke back the flow!

4. This lubricated ball-bearing SWIVEL permits full rotation of the drilling string to further prevent freezing the pipe. It rotates with the table while the Gooseneck Connection above remains stationary—and circulation is continued for proper well control.

Use the Bowen Pressure Control in your production work—wherever you [illegible] maximum well control during wire line operations. Available in sizes to fit your drilling string. Sold outright for export only.



FOR PACKING OFF WIRE LINES

. . . when the circulating swivel and high pressure extension described above are not required, the Bowen Line Wiper shown at right is the ideal tool. It is a completely automatic unit that keeps the wire clean, prevents gas or fluid leakage and maintains a dry and safe rig floor. Pressure-proof . . . fully automatic locking and releasing action . . . simple, sturdy and safe. Available from Bowen headquarters in your territory—sold outright for export only.

BOWEN FISHING TOOL COMPANY

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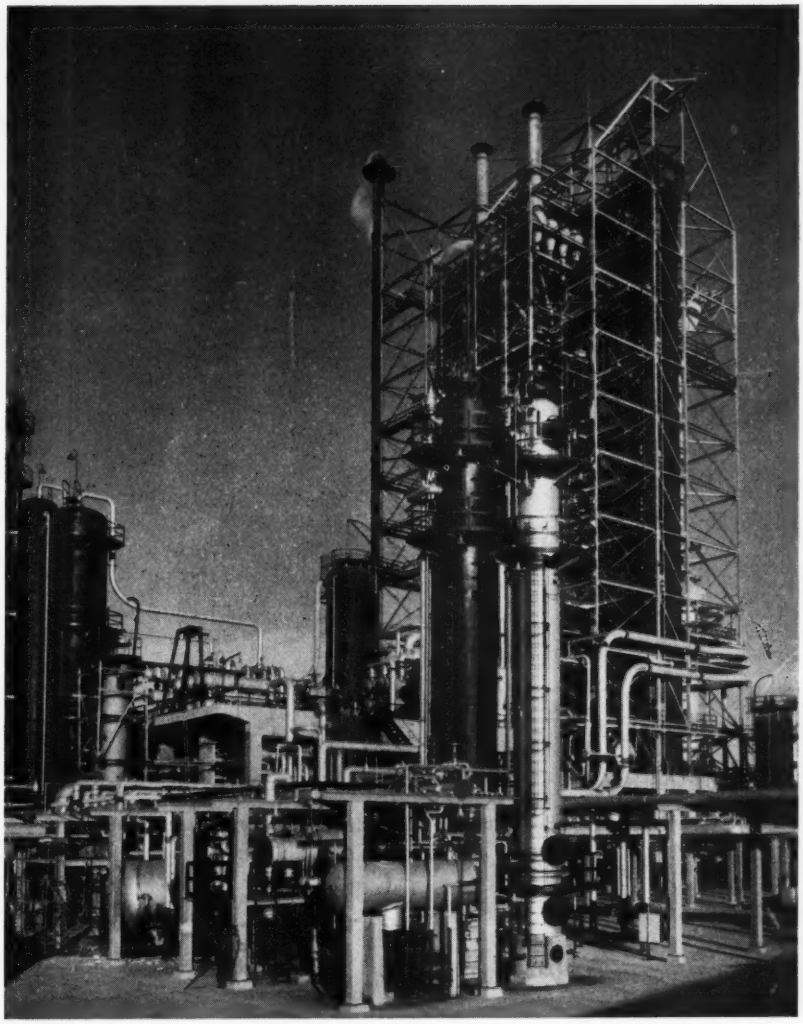
CASPER, WYOMING
Export: S. R. BOWEN CO., 30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

research, refinery process research, production research, agricultural research, and general research. In most institutions the product research is carried on in the vicinity of the refinery, and its scope is wide. It includes the study of such phenomena as isomerization, polymerization, hydrogenation, alkylation; and all the hundred and one processes by which the petroleum hydrocarbon molecules are torn apart and reassembled in more desirable forms. Employed in these investigations are vacuum stills in which mixtures of gases are reduced to liquids, and distilled into their component fractions at temperatures far below zero. Strange assemblies of convolving gas tubes and flasks are used to remove hitherto unremovable constituents from existing compounds, and break down hitherto unbreakable substances. So are determined new wrinkles in refinery process, and so are conjured up new and better products with which to fuel and oil the machines of industry, and to provide basic materials for rubber, plastics, paint and an infinity of related industries.

In the experimentation that has surrounded the development of high octane gasolines, the California petroleum industry has long been engaged. As early as 1920, western refiners had already recognized the fact that napthenes and aromatics had a salutory effect on engine fuel performance. Local research engineers almost since that time have been carrying on extensive researches through dynamometer and road tests designed to determine the desirable characteristics of motor fuel; the effect of individual characteristics on engine performance, and also the effect of various engine settings and load inpositions on the efficiency of the fuel. As a result of these experiments, continued for 25 years at least, California operators have shaped their own contingent research programs, determined the virtues of their own available crudes, and designed methods of refining to yield the maximum of high antiknock fuels. They have determined the role of crank case lubricants on carbon deposition and hence carbon knock, and have succeeded in developing various solvent refining methods by which it is possible to make pure paraffinic lubricants from so-called napthenic crudes.



T.C.C. unit at Union Oil Company's Wilmington refinery, situated almost on the shore line of Los Angeles harbor. This is one of the West's most progressive organizations. With fine research facilities the Company has always been well in the forefront of technological advance. One of its most recent installations is a hypersorption unit —an innovation in the fractionation field, developed in its own laboratories.

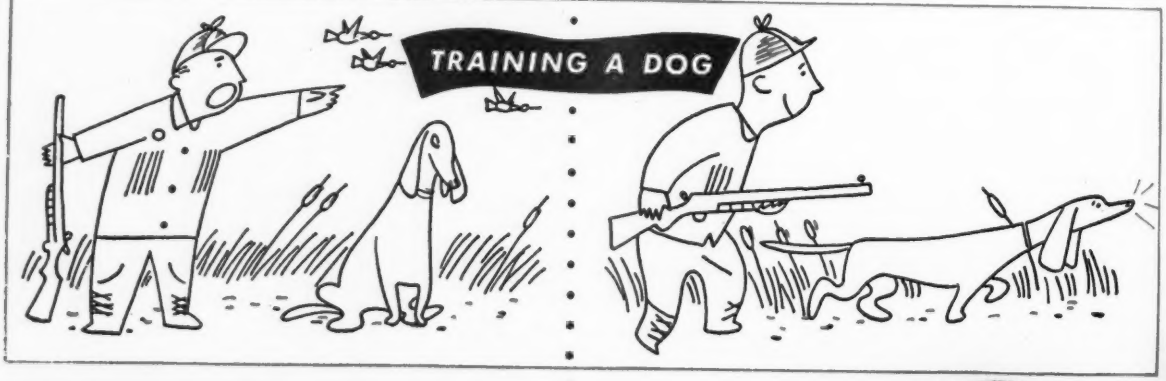
Supplementing the lubricating oil investigations is a comparatively recent study of materials called "additives" which are used to prevent oxidation, or any other type of thermal disintegration, corrosion, engine wear, and effects that are attributable to inadequate lubrication. Then there are the wetting agents, which tend to assure a complete distribution of oil over the contacting surfaces. In fact, there are substances to make oil more oily or less oily as the occasion requires, and no matter what the particular problem of the customer may be, the research laboratory makes an effort to answer it for there is a species of very interesting activity that is extremely important in the overall scheme . . . that is, what might be termed service research. Over the years this phase of occupation has grown tremendously in California, as witness the agricultural research laboratories that are now being administered by a number of the larger oil companies in the west.

Fundamentally, this interest has many functions, but its plan is

KNOW HOW *makes a difference!*

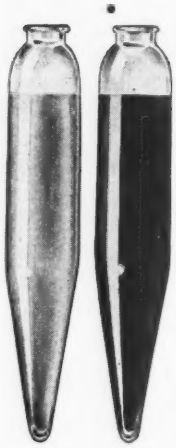
IN DRIVING

TRAINING A DOG



OR BREAKING AN EMULSION

When it comes to emulsion breaking, "know how" is a big advantage you are sure of with Tretolite. The "know how" acquired in many years of treating service for producers everywhere, plus the "know how" gained by many years of careful manufacturing add up to a dehydration service which is unequalled.



TRETOLITE COMPANY

Manufacturing Chemists

ST. LOUIS 19, MISSOURI • LOS ANGELES 22, CALIFORNIA

DEHYDRATING DESALTING

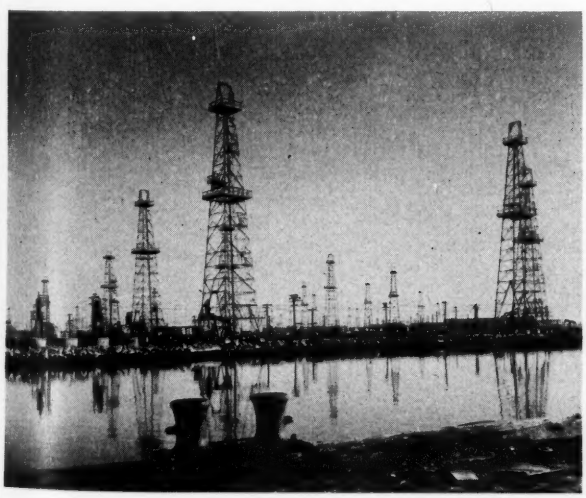
roughly through research to help the farmers in their endless battle against blights and pests that in the past have stolen a large part of their wages, and at times have even affected the entire economy of the country. The citrus business is a sizable industry in California and it was probably through it that the agricultural interest of the petroleum operators was first excited. For years there was keen competition among the various petroleum organizations for the gasoline account, than for fuel oil for the smudge pots. Many an oil company sales head has made himself a lifelong friend in the citrus industry by dashing out with a load of fuel oil at the first sign of an unexpected frost, and before any order had actually been given. The nightmare of the citrusculturalist is a hideous miasma in which his life is made miserable by a callous Jack Frost who delights in invading the orchards when the fruit is just ready to be picked . . . and there is no oil in the smudge pots.

In any case, the farmer was right pleased to find a friend in the oil industry and when it later developed that the petroleum boys were able to develop sprays that did not injure the trees, but killed off certain species of devastating pest the friendship ripened. Eventually the farmer began to discuss other problems with the delivery man, or with the more technical sales service specialist who came around to see how things were going, and soon the oil industry was supplying the farmer with a wide variety of commodities. But still the needs grew and the scope of petroleum company aid expanded until it became necessary to set up a special research lab for handling agricultural research exclusively, and in every rational way helping the farmer to realize more and better from his efforts. There are at the moment at least three large, well equipped laboratories, with enough acreage to do some worthwhile field work, and fully accoutered with qualified personnel and the necessary facilities, to carry on substantive research projects along many lines.

In general, the modus of these institutions is to encourage and exploit new ideas; to check the utility or effectiveness of products derived from petroleum; and to provide a consultation service to which farmers in the community might refer for specialized information or might present problems for solution. Available for consultation and, of course, to carry on the work of the institution adequately are specialists in physiology, plant pathology, nemathorticulture, entomology, plant ology, agricultural engineering, physics, and chemistry. In addition, there are the requisite number of men with experience enough to do the field work as it should be done.

The problems of the farmers are many and diverse. They are constantly suffering losses of one kind or another, and life for the conscientious grower is one long war. He may be the victim of toxic soil conditions, tree decline, and a host of plant blights, wilts, rots, smuts, rusts, cankers and molds. Insects, nematodes, and other pests are his inveterate enemies, and he hardly dares to sleep, lest his crop be spirited away in the night. In spite of his watchfulness, however, these marauders do get away with millions of dollars worth of spoilage each year. It is into this fight that the California petroleum industry has projected itself, and it is certainly making effective progress in the age old feud.

Although much has been done, however, much remains to be done. Plants need many kinds of chemicals to nourish them, kill their parasites and control their diseases, to regulate their reproductive processes and delay their old age. There are mites that do extensive damage to impor-



Another view of Wilmington field, the most prolific producer in California. It yields in the neighborhood of 135,000 barrels a day, and has been responsible for some great advances in drilling and production technique.

In a unique demonstration of operational ingenuity, the Kern River field was put back on production during the war, after it had supposedly been depleted beyond economical revival. This was done by the Tide Water Associated, by the simple expedient of pumping water from the formation faster than it could accumulate, using powerful, shaft-driven turbine pumps.

tant crops, and for which no control has yet been developed. The corn earworm, with which most of us are familiar, still takes his toll of the annual corn crop without being too seriously disturbed. Codling moths raise hob with apples and pears. And others are equally destructive. We will venture to predict, however, that now the petroleum industry is associating itself with the farmer, the team will eventually rout all these pests and the rest of us will be able to bite into our apples with supreme unconcern and unalloyed enjoyment.

Nematodes are an insidious species of parasite that sooner or later get down to the roots of certain plants and do tremendous damage. There is one specimen that is particularly partial to sugar beets, and has been known to destroy the entire crop in an infested area. Some really worthwhile progress has already been made against this microscopic soil-infesting organism, and the agricultural research laboratories of the western petroleum industry have settled down to a general program of extermination that bodes ill for the little beggars. Many chemicals are being tested for nematicidal qualities; and it seems likely that before too long the work of these petroleum researchers will result in some substantial benefits to agriculturalists the world over.

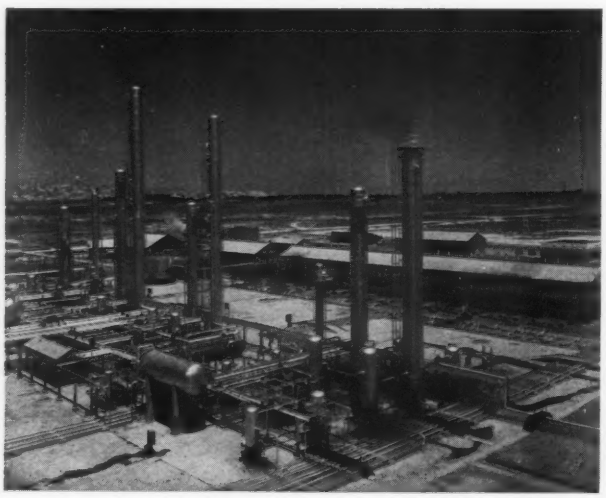
In the field of horticulture, experiments now under way are directed toward the growth of enriched vegetables and fruits through the use of fertilizers that make up mineral deficiencies in the soil and add stimulants; the growth of fruit crops without cultivation; killing weeds selectively without damage to crops or lawns; control rate of growth to develop out-season crops, regulate the size and promote uniform ripening of crops; develop seedless fruits and vegetables, and delay fruit tree blossoming through the dangerous frost period. Sprays have been developed to prevent apples from dropping prematurely, other similarly desirable agents have already been perfected, and the search continues. What progress may be made in this pretentious program it would be dangerous to predict, but we do not hesitate to assert that by some sizable measure, the work of the farmer will yet be made less precarious through his association with the petroleum industry of California and its insistent agricultural reformists.

The plant physiologist is an interesting individual in this group of scientists. His job is to make sure that the cure is not worse than the disease—in other words, that having killed the pest, the insecticide doesn't then become so ambitious as to kill the tree. His business it is to know the effects of sprays, dusts, soil fumigants, herbicides and hormones upon the growth and development of plants, and in general the fundamental relationship of agricultural chemicals to the life processes of plants. The latter vary greatly in sensitivity to the different chemicals, and knowledge of exactly how they react is important. Many compounds in varied concentration and admixture are tested out in the laboratory and in larger scale operations.

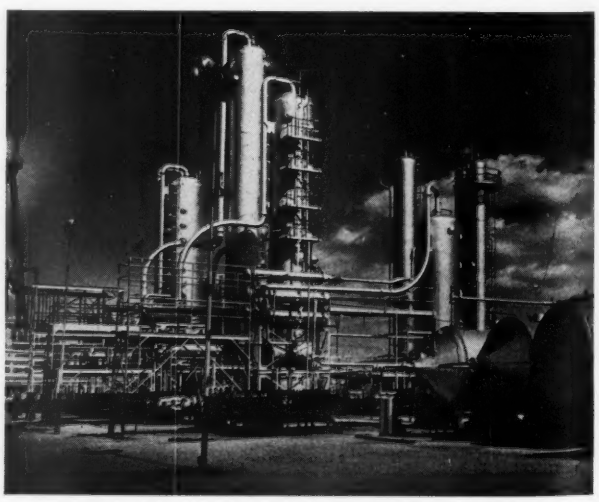
The plant pathologist is especially concerned with the control of plant diseases, and choice of the right fungicide for each manifestation. In his department are tested many organic fungicides for the control of diseases; soil fumigants for control of soil borne pathogenic fungi, and, finally, when a chemical appears to have the essential effects in laboratory work, under the direction of the pathologist, it is tried out under commercial practicable conditions in the field. Together the pathologist and the entomologist study the diseases that are known to be spread by insects, and although these are very difficult to cope with, very satisfactory progress is being made.

Considerable space has been given to the agricultural activities of the

(Continued on page 70)



South Coles Levee recycling plant, is part of another California unitized operation in the vicinity of Bakersfield, that has been operated to the distinct advantage of the individual property owners in the field, and also to the industry at large.



Typical of western enterprise is this distillation unit in which Shell Oil Company manufactures many basic products for the special use of the agriculturists. This is a new phase of petroleum adventure but it is already a sizable part of the industry's business.

Western Oil Industry Is Progressive

By Don E. Gilman
Executive Vice President
Western Oil & Gas Association

As the only oil producing state in the west, California has a responsibility to its sister states which it is meeting with proud determination.

For example, if the oil industry investment in California were distributed among its more than 100,000 employees, each would be the possessor of physical assets worth more than $28,000.

Or put it this way. For every 10 gallons of gasoline sold, as of the end of 1946, somebody invested $800 in capital equipment to produce, manufacture and deliver the finished product.

These figures tend to indicate the size and responsibility of California's oil industry—a three billion dollar plus investment which last year produced 334,685,000 barrels of crude oil, 16,519 barrels of natural gasoline and 5,561,000 barrels of liquefied petroleum gas.

Mere size, of course, is no criterion of need or importance. The fact is that the oil industry attained its size and strength because it is an idustry that produces efficiently and at a reasonable cost what people want and need.

It is particularly essential and important to the west. Oil and natural gas produce 90 per cent of all our energy on the coast. We have little coal or wood. Together they take care of only six per cent of our energy requirements. Add another four per cent provided by vast hydroelectric power developments and the relative importance of the oil industry to the west is more apparent.

After all, the petroleum industry's chief job is to provide energy.

In the west it is a job which daily grows in stature as more and more people come here. Today there are seven people living on the coast for every five who were here in 1940.

Yet western enterprise planned, financed and executed a long range program which is helping to meet these continually expanding requirements. It culminated in building of the 1200-mile, $70,000,000 Texas-California pipeline which at full capacity is capable of delivering natural gas whose daily energy is equivalent to six Hoover Dams or 189 carloads of coal.

Don E. Gilman

The natural gas originates in the Permian Basin area of west Texas, which previously was an untapped source of supply. Before gathering lines were built into fields in the 200-mile long basin, all the natural gas developed had to be vented into the air because no markets were available. Thus the Texas-California pipeline project brings about conservation and profitable utilization of a natural resource which otherwise would be wasted.

In petroleum, California is favored because of its better transportation and distribution setup. Pipelines honeycomb the state from wells to refineries. Short haul rail and truck lines fill in where necessary. Distribution is not a particular problem either and was a contributing factor in the state's good position last winter during the fuel oil dislocation.

The biggest pinch—and it was only a pinch—was felt in fuel oil needed for making electricity. Right now California has 25,557 producing oil and gas wells which for the week ending last March 20 brought in an average 946,700 barrels of crude oil a day, a new state production record.

If such performance continues, it may make conservative the average 938,000 barrels daily production estimated for this year. Attainment of the figure will mean about 342,000,000 barrels may be expected from the state this year, a gain of slightly more than 9,000,000 barrels over last year. The increase is important in view of increasing demand great enough to forecast importation of crude oil into California within the next few years unless there are important discoveries of new fields. It is significant too because of some beliefs that the state's oil fields have reached their probable ultimate efficient rate of production without real new discoveries.

Petroleum reserves in California are estimated at approximately three billion six hundred million (3,600,000,000) barrels. At the present rate of production this amount of oil would last 10 years. California's reserves, however, are being added to either through discovery of new fields or through extensions of present ones so that the state for many years has been more than holding its own, new reserves being in excess of production.

At the present time, California operators are drilling approximately 150 more new wells than a year ago as all efforts go ahead to develop and channel the state's petroleum potential.

An important factor in determining whether California can continue or sustain its present production is steel, an essential in every step of production, refining, storage and marketing. No company in the state has been able to stockpile it. The petroleum industry as a whole has estimated it will require 10,381,000 tons of steel annually for the next several years to meet increasing demands for all petroleum products and California will require a substantial portion of that total.

Incidentally, that need makes the oil burning west and the oil indus-

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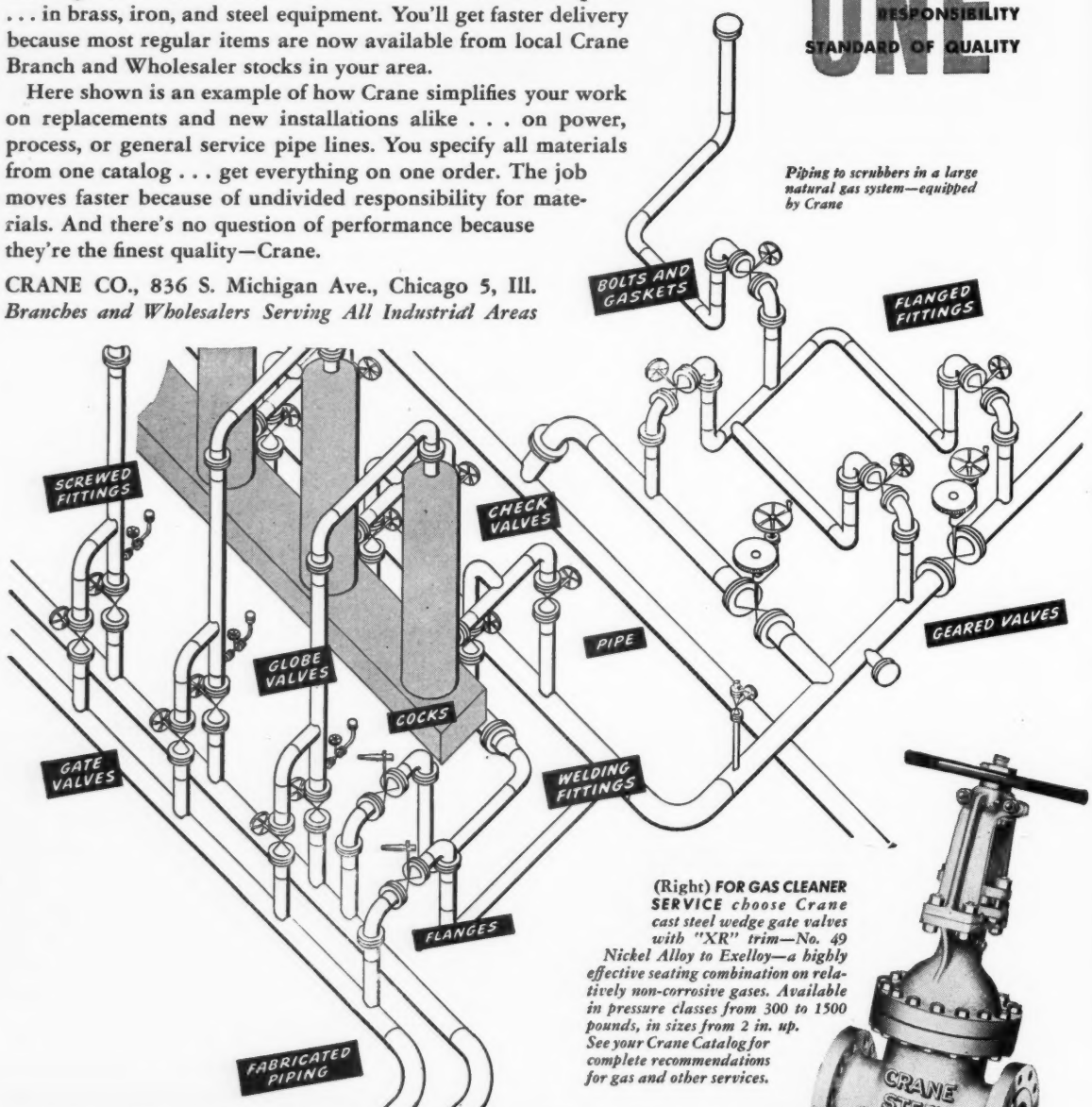

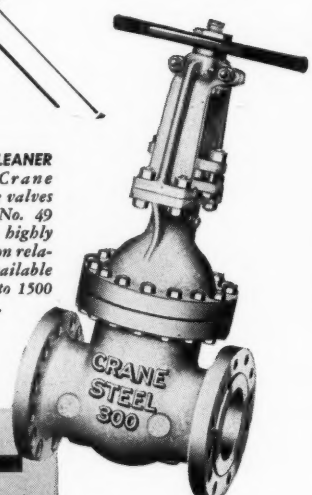

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try particularly sensitive to coal strikes which impede production and delivery of steel.

Petroleum is a progressive industry. It is moving ahead to meet and defeat its problems. The industry has indicated it will spend approximately $13,000,000,000 within the next few years on an expansion program. A great share of that figure will be spent in California.

Standard of California is working on a $2,000,000 research laboratory at Richmond, plans to spend $7,500,000 doubling the capacity of its Bakersfield refinery to handle increased production from the San Joaquin valley and has $2,500,000 earmarked for modernization of its El Segundo plant, to highlight its plans.

Shell Chemical is winding up a $27,000,000 building program, much of which is centered in California; General Petroleum is hard at work on its multi-million dollar downtown Los Angeles structure; Union Oil has $10,000,000 marked for expansion of its lubricating oil facilities at its Oleum refinery and, like other companies, has dozens of projects in the hopper which may get the go-ahead signal at any moment.

All of the companies, of course, irrespective of size, are spending hundreds of millions of dollars in increased exploration and drilling operations.

Operations are not only getting larger and more complex—they are getting better and more efficient. Shell, for example, has come up with a completely portable electric oil well drilling rig capable of boring two miles into the earth.

Thus with new discoveries, new techniques and renewed efforts, California's oil industry is fulfilling its obligations.

Lost Hills Adds Well

Lost Hills has scored two new completions. Richfield Oil Corp. finished Lost Hills Fee No. D-4 in Sec. 12-26s-20e at 2180 ft. for an output of 200 barrels daily of 15 gravity oil. Standard's new Theta No. 13 producer in Sec. 12-26s-20e is pumping 100 barrels a day from 1720 ft. Cut initially was 24 per cent.

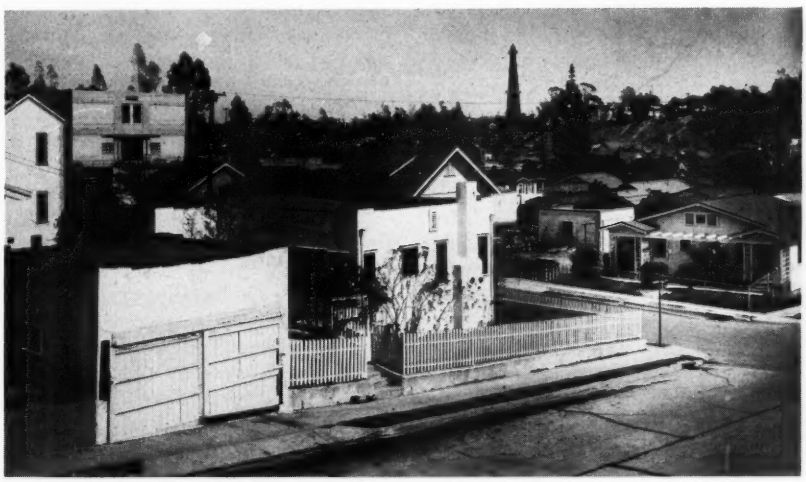
In the Paloma Field, Loffland Bros. contractors for the Pacific Western Oil Co.'s well, Noel-Fee 85. Left to right: F. E. Long, pipe racker; Lummie Robinson, lee tong; P. J. Moore, driller; D. R. Moore, cat head; Paul Elzy, derrick.

Kern Bluff Project In

The Oceanic Oil-Universal combination, which in recent months has been finishing wells at Kern Bluff in clock-like regularity, has added a new producer. It is Vedder-Parkford No. 3, which was brought in from 979 ft. for 60 barrels a day. No. 5 has been completed at 988 ft. and No. 4 is in the finishing stages. The wells are in Sec. 12-29s-28e.

Globe Anticline Project Resumes

After a stop for equipment repairs, Shell Oil Co. has resumed drilling with Vedder-USL No. 1 in Section. 9-31s-22e on the Globe Anticline and at last reports was prospecting ahead below 7000 ft.



Richfield Oil Corporation's Boyle Comm. 17-1, drilling under Los Angeles City ordinance (new model drilling ordinance) Sec. 1301, Municipal Code.

Completely electrified soundproofed rotary equipment.

Located near the center of 30 community leases of 40 acres each—1200 acre lease block—over 6,000 leases.

This is another example of efficient test well drilling in Urbanized areas.

Agency Reviews Wage Increases

By Rush M. Blodget
Executive Vice President
Oil Producers Agency of California

The combined effect of increases in wage rates and of the almost universal inclusion of the cost of living bonus in basic rates in the California oil industry is clearly shown by the current wages and hours survey of drilling and production job classifications, recently completed by Oil Producers Agency.

The current Agency survey of oil field wages is the latest in a series which has been carried on for the past fifteen years, covering 33 job classifications, and is segregated into major company, principal minor company, and independent company groups.

In all of these groups, increases in wage rates which took place during the latter part of last year and the first of this year have brought the median rate of practically every job classification to a higher level. Another factor which has increased the basic wage rate, but has not increased the actual compensation for the individual worker, is the almost complete abandonment of cost of living bonuses as such, but their inclusion in the basic wage rate.

Since most such cost of living bonuses approximated 10 cents per hour, their inclusion as basic wages automatically raised the wage by that amount, but did not increase the worker's actual total compensation. However, wage increases also were made, so that the worker is now being paid an amount equal to more than his former basic wage plus the cost of living bonus.

The seven major companies, all of whom contributed to the Agency survey, show uniformity as to the 40-hour week and as to shift differentials, except for two companies whose agreements vary somewhat from the pattern of a six-cent per hour bonus for the morning tour and a four-cent bonus for the afternoon tour. These variations, however, are more in form than in substance, so that, as a practical matter, it can be said that the major companies pay shift differentials on a six-cent and four-cent basis.

As to wages, the range in the different major company job classifications is from a high of $18.45 per day for a driller to a low of $9.59 for casual labor. At the time of the immediately preceding survey, as of the first of July, 1947, this range was from $16.65 to $8.84.

Rush M. Blodget

The major company median rate for a few typical jobs of the 33 surveyed is $18.20 for drillers, compared with $16.65 last year; $13.04 for well pullers compared with $11.44 last year; $13.07 for pumpers compared with $11.47 last year. Among the crafts, carpenters and electricians have gone from a median rate of $12.80 last year to a median of $14.40 this year, and machinists from $12.75 last year to $14.40 at the present time.

The major companies reported on 4,854 employees in the 33 job classifications surveyed.

Principal minor companies, of which 37 replied to the Agency questionnaire, showed a greater variation in policy than the major companies with respect to both shift differentials and cost of living bonuses. Some of these principal minors, defined as those companies whose production was 45,000 barrels or more per month, retained the cost of living bonus in one form or another, some paid shift differentials, and some did not. The shift differential, when paid, was the same as that paid by the major companies, but the cost of living bonus showed wide differences in policy. One company pays $17.70 per month, one company pays $34.67 per month, one company pays 7% of the base wage rate, and other companies have other forms of bonus. An analysis of the returns shows that, in general, the companies which pay comparatively low wages also pay comparatively high cost of living bonuses, so that while the range in basic rates paid by principal minor companies in each job classification is larger on the whole than is the case among major companies, the total worker compensation, including cost of living bonuses, does not vary greatly among the principal minors, nor does it vary greatly from major company total compensation.

Principal minor company wages range from a high of $19.84 for drillers to a low of $7.24 for watchmen, compared with $16.50 for drillers and $7.00 for laborers last year. Typical median wage rates among principal minors are: $18.10 for drillers, compared with $16.50; $12.80 for well pullers, compared with $11.20 last year; $12.88 for pumpers, compared with $11.20; carpenters and electricians, $14.24 compared with $12.64; machinists, $14.64 compared with $12.85.

Hours also vary somewhat, rather than being standardized at 40 per week. There are several instances of 42-hour weeks (the so-called 6-on, 2-off week) among principal minor companies, with one instance of a regular 48-hour week. However, by far the greatest number of principal minors work on a 40-hour week.

Employees totalling 2,666 were reported on by principal minor companies in the current Agency survey.

As in the case of principal minors, there is a wide variation in policy among independent companies as to the payment of cost of living bonuses, as well as a variation as to payment of shift differentials. In general, independents do not pay shift differentials, but they do pay cost of living bonuses, and, in many instances, add a house, lights, water, and gas to wages, particularly

(Continued on Page 72)

Those Chemical Plans

By
Howard H. Heilman
Consulting Chemical Engineer,
Los Angeles, Calif.

With the mention of the word "chemicals," many thoughts come to mind. It is the commonplace thing these days to talk of petro-chemicals, chemical intermediates, chemicals from agricultural products, chemicals from oil, chemicals from coal, and so on down the line covering chemicals from every source and having almost every end use. There is certainly much food for thought when one ponders the present status of synthetic chemical production of all types and particularly when its rate of expansion is appreciated.

It is almost impossible to read an industrial, technical or trade journal these days without coming across announcements as to new plants for chemicals, or the publication of plans involving millions of dollars for the production of new chemical materials or substitutes for others. A reference, for example,[1] to a recent summary of current construction plans on the part of oil companies shows ten major sized plants underway with the stated sole objective of chemical manufacture. A very significant number of chemical plants are now in active private industry operation, having been leased or purchased from the United States government which hitherto had been used as part of the wartime programs in synthetic rubber or aviation gasoline, etc. The dollars expended and capacity volumes contemplated by major companies within the chemical industry proper are overwhelming in themselves.

There are many references and industrial projections which indicate that chemical production is expanding at geometric rates. The very striking program on production of chemicals from petroleum and natural gas alone has been cited many times.[2] These statistics show, for example, that approximately twenty years ago not even 1/10 of 1 per cent of the organic chemicals which were manufactured in the United States came from petroleum as raw material. In addition, the materials actually manufactured at any time were relatively few in number as opposed to the great multiude of chemical materials now derived from petroleum and natural gas. Compare all this with statistics for the recent past which demonstrate that something in excess of 25 per cent of these organic chemicals are now based on processing petroleum and natural gas. The 3½ billion lbs.

Howard Heilman

of organic chemicals reportedly made in 1946 from petroleum and natural gas sources require only a very small fractional part of the petroleum and natural gas production as raw material. The dollar value of these synthetic organic chemicals is quite another story, however. Instead of cents per gallon the units are in cents per pound. Thus, when we consider that the unit value of these chemicals may average at least 5c per lb., we see that the production value approaches $200,000,000 per year. These latter figures are now two years old and obviously the totals are now far above this figure both with respect to volume and unit prices.

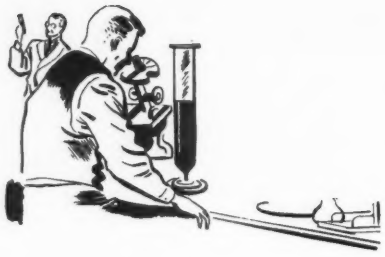
The foregoing figures are probably quite inadequate to describe the rate of chemical development from petroleum and natural gas as it is indicated for the last two years based on formal construction plans and research development projects which are well along their way. The petroleum and natural gas industry and groups are certainly in the forefront of chemical expansion plans. The chemical ventures based on petroleum and natural gas however, are merely a part of many industrial groups. Indeed, there are political groups also involved in this expansion of the chemical industry. The well-established chemical companies themselves, have gone forward at a tremendously accelerated rate toward increasing their pure chemical capacity and obtaining increased supply of raw materials. With respect to this latter point, in many cases chemical ventures as entered upon by petroleum groups and oil companies are directly operations for the production of chemical intermediates which will be processed to final chemical products by existing chemical companies in cooperation with oil companies. In addition to the competition which must exist between oil and straight chemical companies regardless of cooperative ventures, other competitive factors and groups must be considered. There are many other participants in this chemical expansion program who are well financed and technically qualified. Review, for example, the number of operations based on coal tar or on agricultural products. Synthetic fuel programs and recovery of oil from shale all have their influence on the future chemical market. The possibility of political subsidy or the effects on national economics where they are based so rigidly on agricultural products will provide obstacles in some instances.

There is almost no limit to the fields of exploitation where chemical production is concerned. We are all familiar with the usual statements that a given petroleum operation will provide raw materials for insecticides, alcohols, plasticizers, detergents, paints and solvents, etc. These presentations tell only part of the story. In most cases the products available for utilization in the fields given above are now obtained through methods of operation common to many companies within the oil refining industry.

They do not indicate, for example, the great complexity of products which will be evolved when very intensive chemical treatment is practiced on the olefins and aromatics which are now so widespread geographically and available. Obviously, the number of compounds staggers the imagination when not only thermal and catalytical cracking or solvent extraction, but oxidation, halogenation and nitration, or many other treatments are practiced to the utmost. The great multitude of patents recently granted on chemical treatment of petroleum fractions and the quantity of technical literature[3] on this same subject is indicative of the competitive exploitation which is coming when chemicals are offered for use in paints, plastics, insecticides, etc.

It is interesting to clearly cite some of the many factors which have a prime bearing upon the success or failure of these chemical enterprises. It is apparent that the one item of utilization and exploitation of these chemicals as indicated above will be a paramount problem for development and marketing groups. It is safe to say that within a given class of chemicals, there will be a long list of materials available in each instance which differ only slightly in molecular weight, viscosity, unsaturation, or vapor pressure. In this fashion, instead of having a few alcohols available the list of synthetic organic chemicals described properly as alcohols will contain hundreds of compounds. This same situation will be found in the future with respect to aromatic hydrocarbons, olefins, or all the other groups or classes of materials and petroleum fractions and their derivatives. The availability of this great number of materials having the same general properties and differing from each other in only a rather minute way, must introduce a buyer's paradise at least as far as quality variation is concerned. When one realizes the time required for evaluation and consumer checking in paints or plastics and all the other fields, it is then observed readily that exploitation and development time and expense will increase many-fold.

By this same token of complexity and the availability of a myriad



of materials which are closely related chemically, a great versatility of operation and a flexibility of production units must be maintained if a company is to meet the severe twofold competition of cost and quality. Here again, with respect to the cost factor alone in competition, the old story of incremental cost accounting or by-product values may make available chemical compounds at less than straight chemical production values, at least during these long experimental periods. Although it can be expected that the high price levels for petroleum products will in themselves mitigate against a distress value for chemical intermediates, nonetheless, in certain cases where chemicals are necessarily made along with synthetic fuels as an instance, these materials must and will be sold.

It is all important in these chemical projects from oil and natural gas that the raw materials for chemicals have their quality and composition restricted within very narrow limits. The introduction of impurities in a final chemical product may make it unusable even though the amount of that impurity is far lower than the concentration we are used to thinking of in other petroleum commodities. Similarly, in the chemical production field one cannot always assume that the usual oil refining systems on a continuous basis are always the most profitable. There is much to be said when producing chemicals with respect to the merits of batch or semi-continuous processes. Custom-made materials inevitably are required in the chemical field and flexibility of equipment and operation is required for it as well as for economical correction or recovery of off-specification material or in order to minimize corrosion and control problems. For example, the "chain" effects in the chemical industry have been referred to many times and the interlocking nature of many chemical end uses has been cited. Thus, a shortage or high price of one chemical commodity may make obsolete or make unusable a totally unrelated chemical which had been used by a consumer in combination with the first. In this manner, the chemical consumer who must of necessity find a substitute for the material in short supply, may do so, but at the same time will discover that the still available compound no longer will blend or react satisfactorily with the substitute he has found, but that something else will.

Many of the foregoing factors therefore, definitely point to a maximum of depreciation and amortization values on chemical plants even over the previous rates which were sufficiently high in themselves compared to the rates of obsolescence of oil refining equipment. This plant and equipment amortization factor will be found in many cases to represent a sizable portion of the unit cost of the chemical. At the same time, with the expansion of chemical availability, lower profit margins can be expected, except in very limited cases. Potential chemical producers must review carefully the present status and above all, the future program of government subsidized research. It is by no means improbable that the many facets of government subsidized research will cause either severe competition or almost overnight obsolescence of chemicals production even in cases now well integrated.

On the other hand, in spite of all these points of caution the mere complexity of the chemical materials now becoming available and the infinite variations indicated do in themselves point to the development of well-sustained and lucrative chemical enterprises. It appears peculiarly true in projecting utilization for chemicals that a market analysis and competitive survey may result in an erroneous conclusion if based on past statistics alone. The truly significant market analysis would appear to be the one based on judgment and interpretation of the plans for the production of chemicals and fuels and even food collectively. The emphasis should be placed on the plans for chemical production as

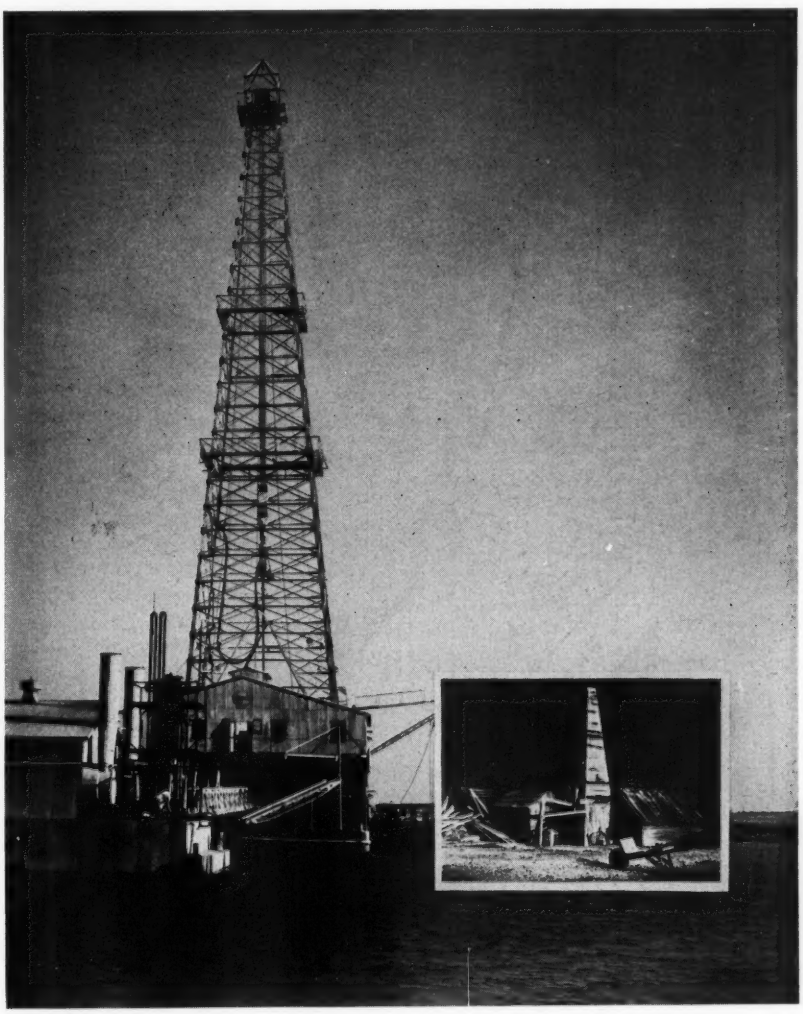
opposed to the past statistics. The caution required to insure a buffer against competitive products through the use of high amortization values is obvious. In addition, it is certainly reasonable to observe that we are coming into a period where social and political trends become doubly important to chemical production. Along these lines one can start by pointing to the intensity of effort by the communities of industrial areas to minimize the release of effluent liquids and gases. From such restriction, on down to the more distressing activities by political groups with respect to material subsidies we find factors which must be evaluated to insure the continued success of chemical production. Just as there must be an exploitation period in the utilization of either greater volumes or greater numbers of chemicals so there may be required a period of subsidy or support to those peoples who previously produced natural chemical products from the land. It is inevitable that this latter situation becomes more pressing and urgent. May the subsidy or support be only temporary and let us hope that both political and financial support will be derived by qualified technical and economic guidance to that end. This type of problem can be seen in many fields, specifically for example, the fields of rubber, shellac, alcohol, etc.

Although we in technical industry look with favor and anticipation on all of these new products and new possibilities, this definitely is not the case with the layman consumer. This, then, means that in addition to the other parts of the competitive or marketing programs by industry a sustained plan for public consumer education appears desirable. The outstanding case in point is the almost universal feeling by the layman consumer that the term "synthetic chemical" or product means an inferior one or a substitute for a better natural product. Well conceived advertising should be undertaken along these lines and would definitely be helpful in this chemical exploitation period. As a matter of fact this resistance to new, and particularly synthetic, products is not limited to the individual and layman consumer. We know of cases where whole industries have refused to use a new product on the fiction that although they could not tell the chemical difference from the natural product, that the synthetic one "just wouldn't work." There are instances where this education policy is followed in a limited way through coining new names for chemical materials produced synthetically. This, in itself, is quite insufficient however, since the greatest intensity of unprejudiced interest and acceptance by the public at large can be obtained only through the understanding that the term "synthetic" denotes an achievement and an advancement for some phase of everyday life or work.

References:
[1]Petroleum Refiner, January, 1948.
[2]Egloff, Chemical and Engineering News, Volume 25, No. 49, December 8, 1947.—F. W. Miller, California Oil World, February, 1948, and others.
[3]Utilization of Natural Gases for Petroleum Products (and Bibliography) I.C. 7347, March, 1947 — Bureau of Mines.

Wilmington Well Starts

Brookline Oil Co. is continuing its development campaign in the Wilmington field by starting Parcel No. A-5 in Sec. 5-5s-13w.



Oil derricks have grown with the nation's need for oil. The most powerful drilling rig ever built (left) includes a derrick 186 feet high, mounted on a barge that puts its top 225 feet above the Louisiana bayou where it is drilling a new well for the Shell Oil Company. The 40-foot wooden derrick, shown in accurate scale in the insert, was used by Colonel Drake to drill America's first oil well at Titusville, Pa., in 1859. Drake's well was 69 feet deep. The new rig can drill to 18,000 feet or deeper.

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Desirable Characteristics and Design of Oil Well Pumping Units and Engines

By
J. C. Slonneger

In the normal course of development of any machine, the fundamental engineering procedure and design tend to stabilize. Of course it is very rare for an entire design to become stabilized even in very simple machines, but usually certain elements do assume a likeness amongst all designers, and are recognized as satisfactory in both economy and function. When elements receive such universal acceptance they may be established as standards. Such is the normal development of standards. Sometimes the process is reversed; that is to say; the standardization of an element precedes and dictates the universal design.

Much of the standardization sponsored and adopted by the A.P.I. for pumping units falls in this rather unusual class. The application of the gear and chain reducers to oil well pumping in general, and then their application to the unit pumper was so rapid, as to cause an extraordinary amount of confusion. The A.P.I. deemed it wise to force the normal process of standardization. The excellent results obtained unquestionably declare the wisdom of that decision.

Rating Gear and Chain Unit Reducers

Up to the present, the A.P.I has adopted a standard method of rating gear and chain unit reducers and also a number of definite sizes. The operator of a unit reducer bearing the A.P.I. name plate is assured of a very definite minimum capacity in each size of unit, and the manufacturer is freed from the unnecessary expense incurred in providing unneeded sizes to the market. By A.P.I. standards, unit reducers are rated in capacity on inch-pound torque, instead of an average horsepower. This in itself revolutionized the application of unit reducers and eliminated much of the confusion of previous reference.

Beyond the method of testing and rating pumping engines, the A.P.I. has done very little in standardization for engines. Unfortunately, the method of rating engines as adopted by the A.P.I. neglects to give any consideration to flywheel size, and its effect on engine rating for oil well pumping. We shall discuss this a little later.

Standardization has many desirable advantages, but it also has its limitation. It is something difficult to decide where standardization should stop and where the ingenuity of the designer should be given its full scope. Too much standardization halts progress, and brings on decay, whereas too little standardization breeds chaos. Of course, that which is capable of definite proof, or that which has been proven can, and should be standardized. But all design is not capable of definite proof. Under those circumstances, standardization may go only as far and as fast as good practice is generally recognized and accepted. When the need of standardization is great and very apparent, it is often wise to take the risk of error by forcing standardization. We pick the plum a little green, so to speak, and let it ripen on the shelf. By doing so, we change the standards slowly to fit the progress, yet the standards thereby direct progress in an orderly fashion, and increase the rate of progress. Thus we reach the same end result, but with a minimum of time and confusion.

What remains to be standardized in pumping equipment, and why the delay, is good for a long argument any time two or more experienced men get together who have to deal with oil well pumping. Why all this confusion? The problems involved in oil well pumping are very complicated, and involve a great many factors which are not generally very well understood, all of which makes for confusion.

As is the case in all engineering, the most difficult problem is to

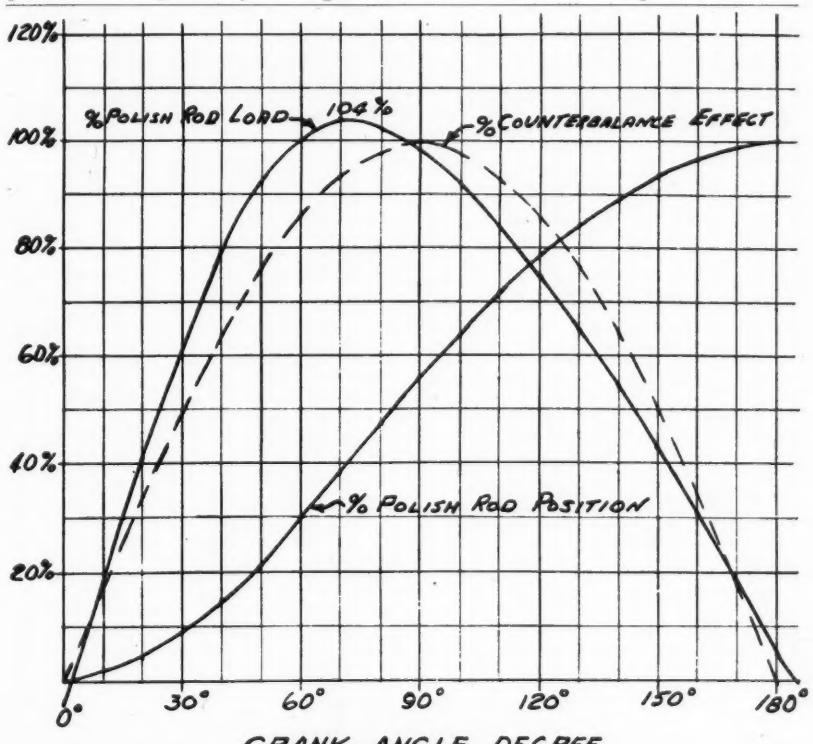


FIG. I

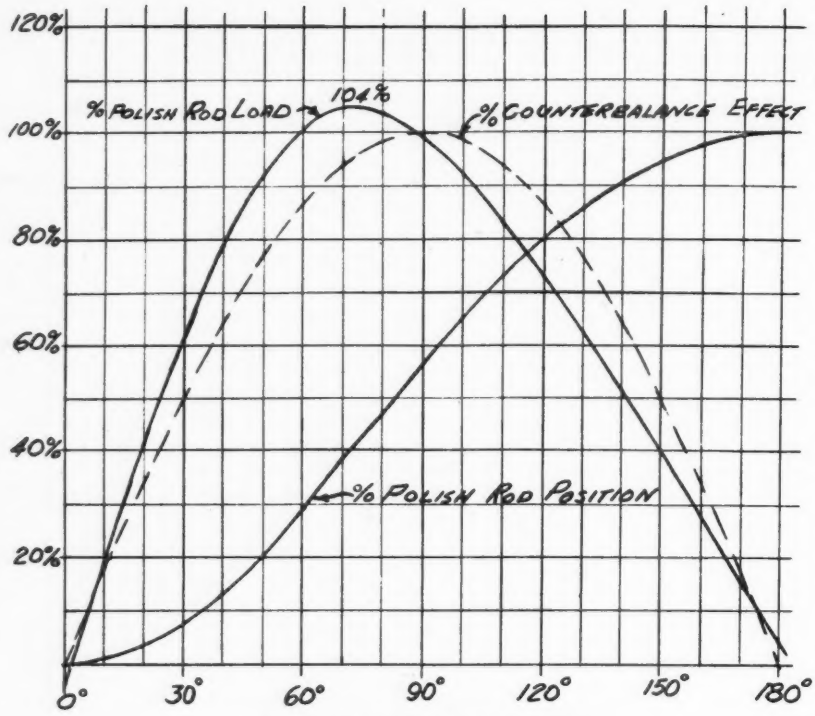


FIG II

state the problem accurately. Too often we solve a problem rightly only to find we have solved the wrong problem. We did not state the problem rightly to start with. The right problem may not have been any more difficult to solve than the wrong one, but we are led astray because we failed to state our problem rightly. In the following discussion I propose to show some common errors in stating the diverse problem involved in sucker rod pumping.

Sucker Rod Function

The fundamental problem in sucker rod pumping is to deliver the desired quantity of fluid from the bottom of the well to the tank, with the greatest economy and least effort. There is no argument about this, for it is precisely this that we are all striving to do The next problem is to force the plunger and its cylinder to have a relative reciprocating motion. Where the distance from the cross head to the plunger is quite short, as in a common power pump, no serious problem is involved, but when the piston rod, commonly called sucker rods, is lengthened to any length from 1,000 to 7,000 feet, we are confronted with an entirely different and quite complicated problem. The motion imparted to the plunger is no longer identical with the motion of the crosshead, commonly called the rod hanger. The stretch of the sucker rods becomes of such magnitude as to seriously and appreciably change the motion of the plunger with respect to that of the rod hanger. Some writers upon this subject have taken the stretch of the rods due to load into consideration, and have shown that the most fluid will be pumped if the stretch of the rods due to load on the plunger is one-half the stroke length. But that is not true, because those writers solved the wrong problem rightly. It is true that rods stretch due to a static load. But that is only half the truth. The other half is that rods also stretch due to their own inertia.

I choose to call the static stretch: static resilience — and the stretch due to inertia; dynamic resilience. The spring constant, (that is, that force as measured at the polish rod to produce one inch of stretch) I choose to designate K_1 for dynamic resilience and K_2 for static resilience. For a straight string of rods (rods all of one size):

$$K_1 / K_2 = 2$$

For tapered rod string the ratio of K_1 to K_2 has some value other than 2, but that value can never be equal to one, hence K_1 and K_2 always differ.

Since the rod string possesses both mass and resilience, it must have a natural frequency of vibration. Hence, we not only have a rod string that may stretch in two different ways, but we also have one which is subject to vibration. As a corollary to this, we may say: since there is no known way whereby a force may be transmitted from one point to another without the lapse of time, a definite period of time is required to transmit a force from the polish rod to the opposite end of the rod string. Since the solution of this problem has enough material in it for several papers, its solution is beyond the scope of this paper. It is pointed out here to show that in selecting pump sizes, rod sizes, speed and stroke length most operators have been solving the wrong problem rightly with some very confusing results. That all this is actually true is evidenced by the many curious and sometimes fascinating shapes of the dynagraph taken at the polish rod, and which are wholly unexplainable except by the application of the above-mentioned properties of sucker rods.

Sucker Rod Vibration

It is interesting to note that the theory of sucker-rod vibration was first discussed in 1937, and recently has gained some acceptance and application. The application of rod vibration and the dynamic and static spring contents to dynagraph analysis was published in bulletin Number 230, Proceedings Twenty-fourth Council Meeting of the A.P.I. 1943, as a discussion of well loads. I don't think it has been much used except by its author. In addtion to this, there is a host of other factors, such as gas-oil ratio, bottom hole pressure, tubing stretch, etc., which produce their full effect upon the dynagraph. But these factors are of secondary im-

portance. We must first state and solve the sucker rod problem rightly before we can predict or detect the effect of these secondary factors. In passing it may be well to point out that sucker rods have been standardized by the A.P.I. to a satisfactory degree, and little needs to be done other than keep the standards even with normal progress. There is a possibility that the A.P.I. standardization on pumps has been carried too far, and to some extent are being ignored because they handicap design. This undoubtedly will be corrected in due course.

The instantaneous load at the polish rod as recorded on the dynagraph produces a force at the crankpin of the unit reducer, which in turn produces a torque at crankshaft of the reducer. The numerical value of that torque depends very much upon the geometry or proportion of the unit pumper elements. At the present moment, there are no standards on the proportions or geometry of unit pumpers, with the result the torque effect of a given polish rod load and circumstance varies greatly in the current designs. An attempt was made to standardize the geometry of unit pumpers, as disclosed by J. R. Mahan in bulletin 231 Proceedings Twenty-fifth Annual Meeting A.P.I. 1945. In my opinion it was most unfortunate that the committee rejected the proposal. However, several manufacturers agreed to offer, and are now offering, unit pumpers to the trade having the proposed geometry.

To obtain the value of the torque at the crankshaft of the reducer due to polish-rod load, we may plot a series of curves from the geometry of the unit pumper, such as is shown in Figure I. The load factor curve is plotted against the crank angle such that the polish-rod load multiplied by the stroke radius and that product multiplied by the factor give the torque in inch-pounds due to the polish-rod load only. Also a second curve shows the counterbalance factor plotted against the crank angle position such that the counterbalance in inch-pounds at its maximum value (that is at the 90° position) multiplied by the factor from the curve give the counterbalance effect in inch-pounds for any position of the crank. A third curve shows the polish-rod position in percent of its total stroke plotted against the crank angle. It will be noted that the counterbalance factor is a simple sine curve or simple harmonic motion. The difference between it and the polish-rod load factor curve incidentally shows the deviation of the polish rod motion from simple harmonic motion.

The curves in Figure I are for a horsehead or wire line hanger type unit having the following geometrical proportions:

Working center of the well end of the walking beam equals 1½ times the maximum stroke length.

Samson post height equals 2½ times the maximum stroke length plus 6 inches.

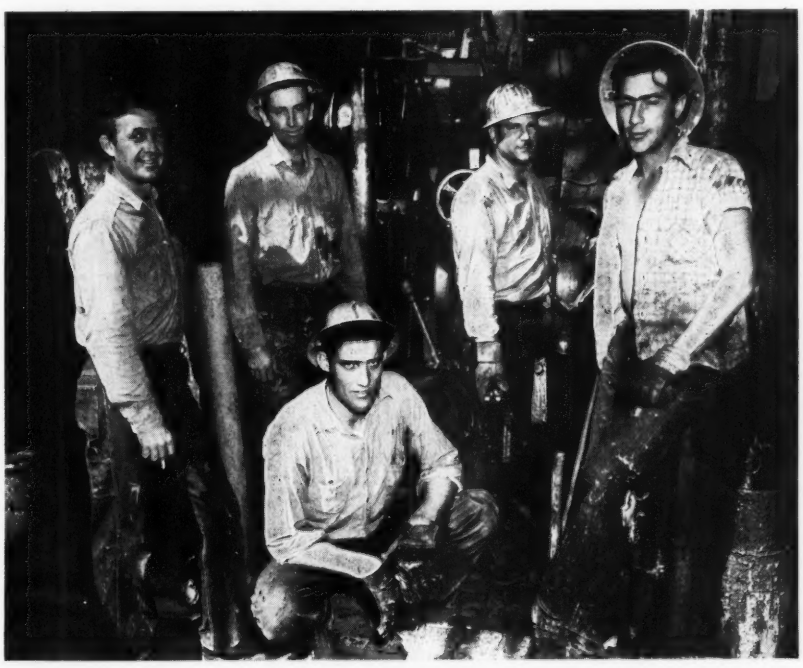
Figure II shows similar curves for a beam hanger type unit pumper. The curves are almost identical with those of Figure I. But to achieve this almost identical result the geometry had to be altered. Here the working centers of the well end of the walking beam is 2 times the maximum stroke length.

Unit Pumper Requires Standardization

After careful study the men sponsoring this geometry of the unit pumper concluded that these proportions achieved the best overall results consistent with economy and practical results. To decrease these proportions for the purpose of reducing first costs could not be justified because of further serious distortion of polish-rod load factor curve, causing overload on all parts including the unit reducer, whereas increasing these proportions added to the first cost without much improvement in the performance curves. In other words, the law of diminishing returns become effective. There is a real need for this standardization, and it is hoped that ultimately the A.P.I. will soon adopt such a standard. Anyone who has taken the time to analyze the unit pumpers now offered to the trade will find some with very bad geometry, which produces a very unsteady motion at the polish rod, and those units are very difficult to counterbalance properly, thus producing unnecessary and destructive forces throughout the entire mechanism from the source of power to the standing valve.

Pumping Engine Requirements

The unit pumper is only half of the problem after we leave the suck-



In the Paloma Field, at Ohio Oil Co.'s well, KCLB 41-30, kneeling: K. C. Crawford, floorman; standing, left to right: J. H. McJunkin, derrick; A. B. Holmes, floorman; Jack Weaver, driller; W. H. Wayts, lee tong.

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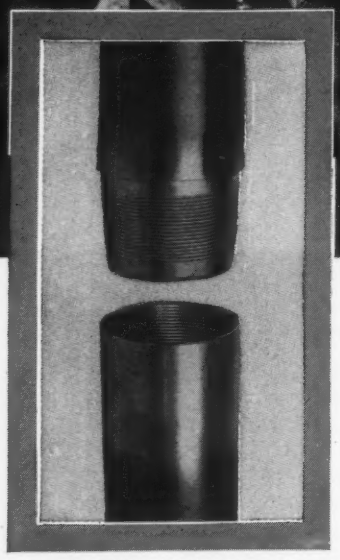

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er rods. The prime mover is the other half. The prime mover may be either an internal combustion engine or an electric motor. I have elected to discuss only the internal comustion engine as a prime mover for oil well pumping with sucker rods. In order to attack the problem, let us first state it.

1. The engine must overcome a very widely fluctuating periodic load, whose peaks may be as much as 3½ times the average load of the period.
2. Since simple harmonic motion is reciprocating motion produced by the least possible maximum force for a given frequency, and amplitude, it follows that the prime mover should run at a nearly uniform speed, so as not to further distort the polish-rod motion.
3. The engine should have a wide range of speed, so that the operator may adjust that speed to meet the changing well conditions, and the engine should maintain that speed day in and day out at the will of the operator.
4. The engine should be well enough constructed to operate 24 hours per day under full rated load.
5. It should be as simple as possible with a minimum number of parts so disposed as to be easily accessible when they require replacement or attention.
6. The engine should be easy to start, should start promptly, and should be easy to service in its routine operation.
7. The engine should operate equally well in winter or summer, and under partial loads. A new well usually requires very little power, so that an engine may be required to operate under light loads for a rather long period of time, before the well becomes heavy.

That is a good-sized order. Obviously, we cannot get an engine to meet all these requirements, off of the shelf. There is a definite need for a specialized design to meet these exacting requirements. Let us take them one by one.

Large Flywheel Aids Engine Operation

An engine cannot overcome the widely fluctuating periodic load by the throttle alone. I say this is impossible because the governor can change the throttle only after the speed changes and the engine can change its power only after the throttle changes. To maintain a constant speed under a fluctuating load by the throttle alone the governor would have to anticipate the load. If it were possible, it would still be undesirable since the throttle would have to function from closed to wide open position twice each cycle, and the engine would have to have a peak horsepower equal to 3½ to 4 times the average horsepower actually required. It can be accomplished by giving the engine a large flywheel so that by taking a 5% drop in the speed the flywheel will give up sufficient energy to pass through the high peak requirement and the engine can restore this energy to the flywheel during the period when less than average power required. It has been found that 5,000 foot-pounds of energy stored in the flywheel per horsepower at maximum rated speed and horsepower will give the desired results. The flywheel must be on the engine where it reduces cyclical variation and is cushioned by the resilience of the belt drive to the unit reducer. The heavy flywheel has gained much recognition.

The heavy flywheel meets the second requirement of reasonably uniform speed provided the governor does not hunt due to the unsteady load and the 5% change in speed. The governor should be damped so as to hold the throttle

In the Del Valle Field at Ohio Oil Co. well, Vasquez No. 14, standing, left to right: R. R. Walter, pipe racker; J. M. Smith, derrick; D. A. Lee, lee tong; "Paddie" Ryan, driller; kneeling: A. A. McKay, cat head (unscrewing instrument); "Sid" Broom, tool pusher, behind McKay.

In the Edison Field, Ammons & Martin, Contractors for British American Oil Co.'s Berry No. 75-4A, front row, left to right: Hubert Harns, back up; Roger Murray, derrick; rear row, left to right: P. L. Savage, cat head; Bill Dounies, pipe racker; W. M. Coots, driller.

steady for the short period of time in which the speed varies from the average. At the present time this idea is still an innovation, but it works.

A damped governor can be made very sensitive without causing it to hunt, so that once set for a given average speed the governor will hold that average speed indefinitely. Unfortunately, many engines now in use for oil well pumping have only a "top speed" governor and the operator sets a throttle in a fixed position to obtain the desired pumping speed. That is in an engine taken off the shelf, probably designed for some purpose other than oil well pumping.

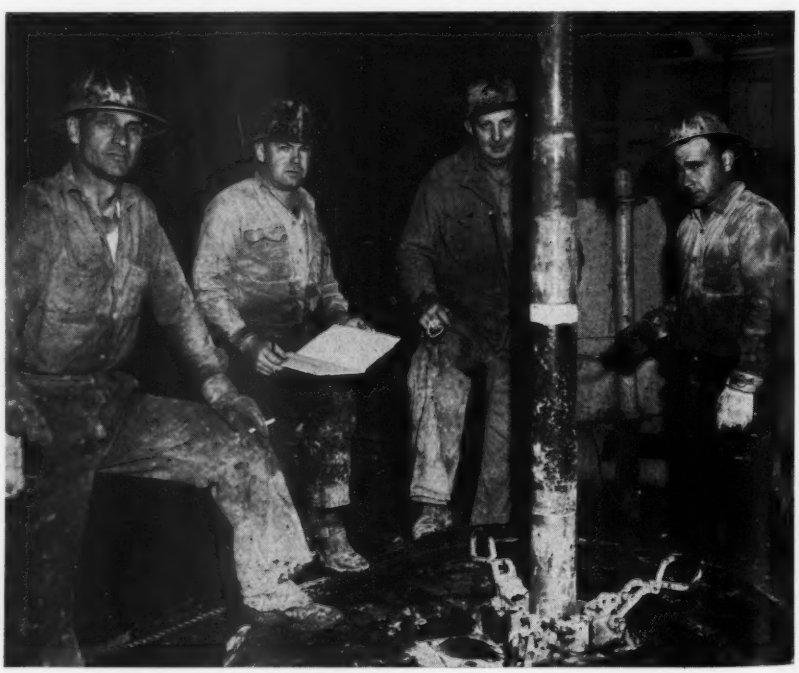
Pumping Engine Should Be Heavy Duty

For twenty-four hours operation an engine must be generously designed. Fundamentally, no engine can be better than its crankshaft. For twenty-four hours service under full load the engine must have a rigid crankshaft which maintains its alignment under stress within an increment less than the thickness of an oil film, and sufficiently rigid to avoid criticals which a heavy flywheel might induce. A heavy flywheel needs a more rigid shaft than a light flywheel. Incidentally, the heavy flywheel permits the engine to put out its full rated horsepower on a pumping well, because it prevents the closing of the throttle since it does not overspeed. The A.P.I. method of rating engines does not recognize this in their standards, and recommend that an engine be applied at 65% of its maximum output. With a heavy flywheel and its rigid crankshaft, we may restrict the inlet manifold so that the engine cannot be overloaded and then apply it at its full rating with the restricted manifold. We do not apply electric motors at all they can pull, we restrict an oil well pumping engine to prevent overload. The remainder of the engine must be designed generously to function under severe conditions. It must not be designed to meet a price.

Up to about 30 horsepower, the single cylinder horizontal engine offers the greatest possibility in simplicity and accessibility. It also is well adapted to carry the necessary heavy flywheel. Above 30 horsepower the single horizontal engine becomes too cumbersome, and unwieldy.

Engine Starting Needs Improvement

An engine should start easy, and promptly. Automatic starting on small engines is not important if the engines have been properly designed. In the larger engines automatic starting is still not what it should be. We are in need of more thought on that subject. Moreover,



In the Del Valle Field, Crestmont Oil Co.'s Ramona No. 1, George Terry, drilling contractor. Left to right: Leonard Branch, pipe racker; James Dye, lee tong; W. E. McHenry, driller; Jack Rector, cat head. The boys are engaged in calibrating the drill collar.

we eliminate many startings if we arrange to add oil and water without stopping the engine. With such an arrangement, an engine may run 30 days without stopping, and hence without starting in that interval. We have not yet found a way to change oil in an engine without stopping it.

Vapor or steam cooling has solved the problem of operating under wide ranges of climate and load. Vapor cooling holds the engine at the boiling point regardless of extraneous temperature or magnitude of load. Vapor cooling is easily applied to the horizontal engine, but very complicated and next to impossible to apply to a vertical engine.

I have tried to show that applying any type of engine, say 10 horsepower to a "10 horsepower" unit pumper a well requiring 110 horsepower is also solving the wrong problem rightly. It does not work that way.

To connect the engine to the unit reducer we need some kind of a belt drive. Now if we wished to solve the wrong problem rightly we would put a 20 horsepower belt drive on a 20 horsepower engine. We have learned, however, that the belt drive must be able to handle the peak torque of the unit reducer. Actually, that is still not the whole problem. The belt drive should be checked for the tuning of the system to avoid critical torsional vibration. Much trouble comes unsuspectedly from this source.

Where the given setup is likely to be duplicated many times such calculation on the selection of a drive are worthwhile.

Many engine parts have already been standardized by the Society of Automotive Engineers, and need no further standardization by the A.P.I. However, I do believe there is need of establishing some standard of performance of engine on pumping wells. It would appear that some minimum requirement for the stored energy in flywheel per full rated horsepower would be of great benefit to the user.

Also some minimum of governed speed range in a pumping engine would pay dividends if established as a standard. You will observe I use the term "minimum," for I wish to leave as much as possible to the skill and ingenuity of the designer. If the designer can exceed the standards, all well and good, but the standards should be high enough to exclude the clumsy and the frauds.

Abstract of a paper presented at Spring Meeting, Mid-Continent District A.P.I. Div. of Production, Wichita, Kansas, March 25-26, 1948.

Lindsay Hills Try Grows Deep

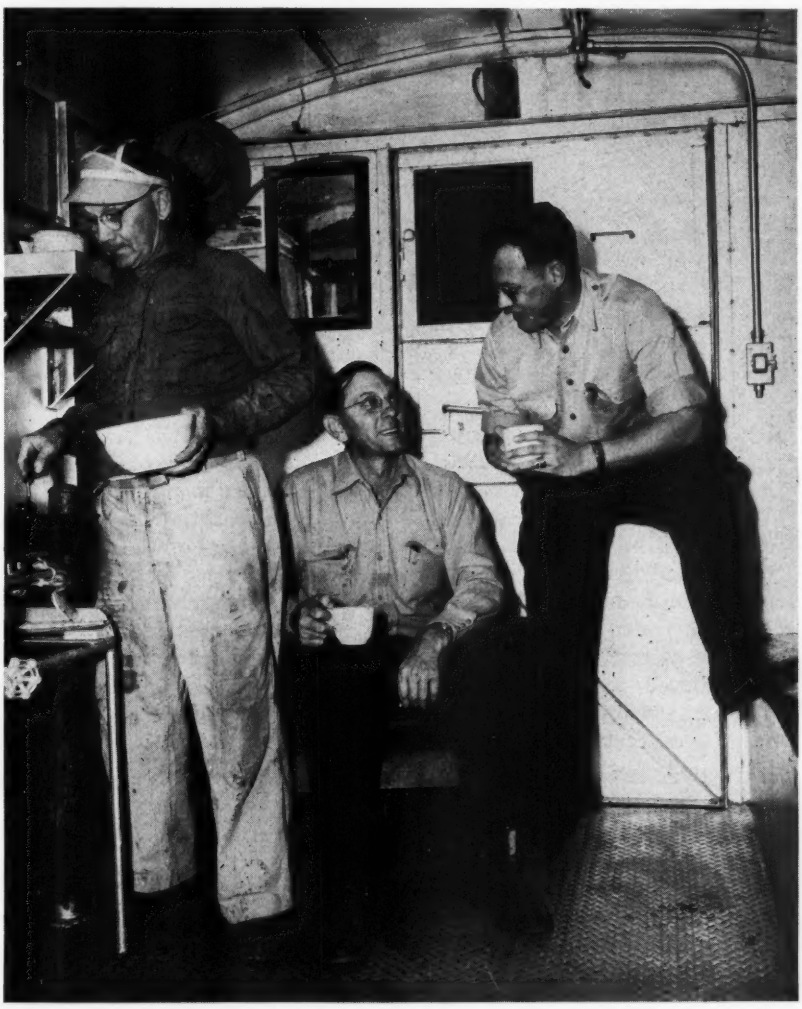
Standard of California's interesting Van Sicklin No. 45 exploratory hole in the Lindsay Hills in San Joaquin Valley is making hole ahead below 9000 ft., without reported showings of oil or gas.

Kern River Active Area

The development campaign of heavy oil from shallow wells is continuing in the Kern River field. Two more wells are starting there. They are Virginia Oil & Land Co.'s No. 19 in Sec. 19-28s-28e, and Sewell & Jones' No. 12 in Sec. 36-28s-27e. The field numbers at present more than 25 drilling jobs at various operational stages.

McDonald Test Pumps

San Joaquin Exploration Co. has given the finishing touches to its Layman No. 7 in Sec. 12-28s-19e on the MacDonald Anticline. The well is pumping an unestimated yield from 822 ft.

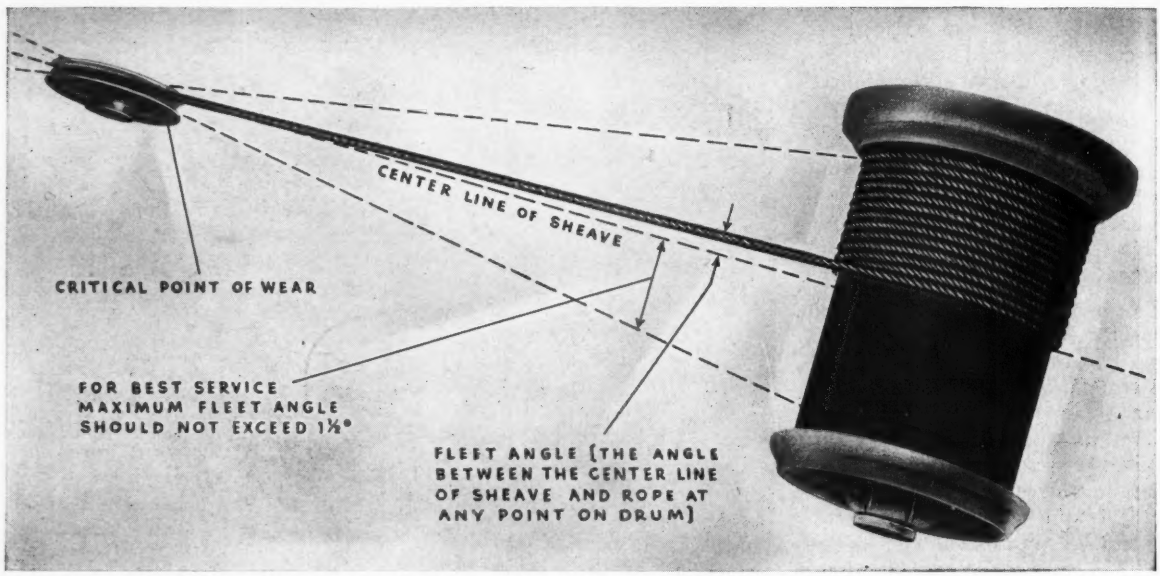


On the Ohio Oil Co. lease in the Del Valle Field, Fireman E. E. Walters, cooks up a "batch" for M. R. Rosenlieb, foreman Del Valle Field (seated); and C. L. Kistner, Petroleum Engineer, Ohio Oil Co., Bakersfield.

Proper fleet angle stops sheave-wear on wire rope

A Columbia wear-saving tip

The fleet angle is the side angle at which the rope approaches the sheave from the drum. Too great an angle will result in wear on the rope by the flanges of the sheave. The maximum safe fleet angle is generally considered to be 1½ degrees—equivalent to forty feet of lead for each foot of traverse travel on the drum on either side of the center line of the sheave. For example... a drum with a two-foot traverse should be placed forty feet from the sheave.


CENTER LINE OF SHEAVE
CRITICAL POINT OF WEAR
FOR BEST SERVICE MAXIMUM FLEET ANGLE SHOULD NOT EXCEED 1½°
FLEET ANGLE (THE ANGLE BETWEEN THE CENTER LINE OF SHEAVE AND ROPE AT ANY POINT ON DRUM)

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UNITED STATES STEEL

With Drilling Contractors

American Association of Oilwell Drilling Contractors has announced that the next quarterly meeting of directors will be held in New Orleans.

This follows the policy line of the association to rotate these meetings of stimulating greater local interest in the various drilling districts.

Advance reservations for the summer gathering already indicate a near-record attendance, the association reported. Many directors plan to combine business with pleasure while visiting one of America's most distinctive and romantic cities.

Exact date of the Southern conclave will be announced in the near future.

The association's eighth annual national meeting will take place at Houston on October 11-13. Headquarters will be at the Rice Hotel. Howard Phifer, L. D. Cain Drilling Co., 1117 City National Bank Building, Houston, heads the committee in charge of room reservations.

W. F. (Frank) Jones, secretary of the California chapter of the AAODC, spoke at the dinner meeting of contractors held at Scully's Cafe, Los Angeles. His topic was "Cost Accounting."

At a previous meeting of drilling contractors in Bakersfield, Brad Mills, executive vice president of the association, revealed that approximately 80 per cent of the wells drilled in the United States are contract jobs. He also disclosed that currently there are about 2950 rotary rigs in the country, of which about 200 are active, 400 idle temporarily and 450 stacked.

A principal speaker of the Bakersfield meeting was Ed Steele, manager of the San Joaquin Valley operations of Oil Base Mud, Inc.

Deeper drilling is not so much a matter of larger equipment as it is a search for better and more completely suitable mud materials, according to Steele. He explained that while the ideal drilling fluid is oil-and this is used in many instances—it is not always practical to use it.

However, he said, a material which closely approaches oil is the ideal drilling agent. Each type of mud probably has its place, but its selection should be carefully determined, Steele concluded.

The mud classes sponsored by the AAODC at John Dewey at Long Beach have been highly successful.

A. S. Hayes, a leading figure in contract drilling circles, has reported that many applications are coming to California headquarters of the association for classes at Fullerton, Whittier and San Joaquin Valley centers.

The mud classes mark only a part of the association's education program, Hayes stated. In preparation is a course in oil field safety practice, which promises to have the enthusiastic support of all members of the AAODC.

New contracts assigned to Fowler Drilling Co. included P. D. No. 5 for Signal Oil & Gas Co. in the Long Beach Harbor area, and the redrilling of Wylie No. 7 for Hancock-General in the Santa Maria field.

Camay Drilling Co. has been awarded contract to drill Standard of California's No. 89 in the Huntington Beach field. Camay also is starting Tognazzini No. 2 for Standard at Gato Ridge.

Union Oil Co.'s Crandall Government No. 1 east of the Lompoc field will be drilled under contract by Santa Maria Drilling Co.

Gene Reid Drilling Co. has the contract to redrill for Signal Oil & Gas Co. Surfluh No. 2 in the Raisin City field.

T. P. Pike Drilling Co. has successfully completed Rosenberg No. 3 for Texas Co. in the San Ardo area in Monterey County. The well is pumping clean oil from a plugged back depth of 2190 ft.

Coastal Drilling Co. has opened offices at 533 Roosevelt Building in Los Angeles. Fred Manning, president of the firm, is the owner of a large contract drilling organization in the Rocky Mountain area. Coastal is drilling Continental's KCL No. O-1 at Buena Vista, and KCL No. L-2 at San Emigdio.

Contracts have been let to Brown Drilling Co. to drill Standard of California's Surf No. 1 in the Huntington Beach field, and a well for D. D. Feldman at Rio Vista.

Severns Drilling Co. has contracted to drill Union Oil Co.'s Callender No. 113 deep well at Dominguez, and Texas Co.'s Bauman No. 9 and 10 at Long Beach.

Terminal Drilling Co. on contract is drilling U. P. No. 300 and U. P. No. 401 for Union Pacific Railroad in the Long Beach Harbor area. Terminal Drilling is a change in name from Harbor Production Co., with address and personnel as before. Harbor Production in the future will continue as a production service organization only.

Personalities IN THE NEWS

Norman Heads Stripper Well Association

Election of Victor L. Norman, well known California independent oil man, to the presidency of the California Stripper Well Association was announced recently. The election took place at the annual meeting of the board of directors of the statewide independent oil trade group held in Los Angeles.

Victor L. Norman

L. A. Donnelly, vice president of Exeter Oil Company, Ltd, Edwin P. Crail, president of Victory Oil Company, and Lloyd M. Willis, vice president of D. D. Dunlap Oil Company, were elected as vice presidents; Thomas H. Work, of Nordon Corp., Ltd., was re-elected secretary-treasurer; and Richard Fenton, executive vice-president of the association since its organization nine years ago, was likewise re-elected.

Norman, the new president of the stripper oil well group, succeeds Earle F. Demond, who served as head of the organization for the past year. The newly elected official is a resident of Long Beach, California having resided there for the past nine years. He is a native Oklahoman and a graduate of Oklahoma A. & M. College with a degree in electrical engineering. At the outbreak of World War I, he enlisted in the first officer's training camp and received a commission as 2nd Lieutenant, serving overseas and throughout the duration of the war until September, 1919.

After being discharged from the service Norman was employed by Marland Oil Company and served in the general offices of the organization, following which he became identified with Shell Oil Company's production department and later with the Phillips Petroleum Company in the Land and Legal Division. He came to California in 1938 becoming associated with Woolner Oil Corporation, Ltd., as Vice President and General Manager, in which capacity he still serves.

Newly elected directors of the California Stripper Well Association chosen to serve with Victor L. Norman for the ensuing year are Fred I. Barkis, Selbar Oil Company; George F. Brayton; Edwin P. Crail, Victory Oil Company; William H. Cree; Robert C. Davis, Davis Investment Company; Earle F. Demond; Chester F. Dolley, Atlantic Oil Company; L. A. Donnelly, Exeter Oil Company, Ltd.; D. W. Elliott; Walter Everts, Jr., Dumm Bros. Petroleum Corp.; Richard Fenton; Wilbur B. Harrison, Apex Petroleum Corp.; Jack Herley, Herley-Kelley; A. S. Johnston, A. S. Johnston Drilling Corp.; A. W. Lyddon, West American Oil Co.; Felix Mallon; Karl P. Neilsen, Neilsen Pump Division of Oil Well Supply Co.; Fred O'Brien, Emerald Oil Company; Milton H. Philleo, Estate of Louise E. Dabney; E. W. Randolph, Century Oil Company; Joseph C. Shell, Royal Petroleum Company; O. M. Slosson; R. M. Stephens, Stephens Petroleum Company; R. H. Thompson, Royalty Service Corp.; V. R. G. Wilbur; Lloyd M. Willis, D. D. Dunlap Oil Co.; Thomas H. Work, Nordon Corp. Ltd.; and Chester F. Yunker, Del Amo Estate Company.

Nine Los Angeles Men Appointed to Important IPAA Posts

Nine independent oil men from Los Angeles have been appointed to important committee posts in the Independent Petroleum Association of America.

These include W. C. Whaley, of the Barnsdall Oil company, who was elected to the Executive committee and C. A. Johnson, president of the Holly Development Company, who was named a vice president for the State of California. In addition Whaley was appointed to the Meeting Program committee and Johnson to the Membership committee.

Other committee appointments are L. L. Aubert, president of Bankline Oil company, to membership on the Nominatnig committee; Rush M. Blodget, secretary-treasurer, Blackfoot Petroleum Company, to membership on the National Oil & Gas Policy committee; Richard A. Grant, Fullerton Oil Company, to membership on the Tax Policy and Advisory committee; Robert S. Lytle, Los Nietos Company, to membership on the Public Relations committee; Charles C. Spicer, president of Republic Petroleum Company, to membership on the Resolutions committee; Lawrence Vander Leck to membership on the Budget committee, and Lloyd Williamson, president of Lakeport Petroleum Company, to membership on the Secondary Recovery & Stripper Well committee.

Bob New Expands to Mid-Continent

Robert V. New, president of Bob New Incorporated, has just announced the expansion of his oil activities to the Mid-Continent area.

O. Sherman Broumley

The corporation has appointed Mr. O. Sherman Broumley as vice president in charge of Operations. Mr. Broumley temporarily will headquarter at the Adolphus Hotel, Dallas. Mr. Broumley started in the oil fields in Oklahoma in 1912, and came to California in 1918 where he worked for the Shell Oil Co., Inc., for ten years as driller and tool pusher. In 1928 he went with Pacific Western Oil Co. where he drilled the wells on the piers into the ocean at Elwood, California.

From 1930 to 1943 he was with the Kettleman North Dome Assn., following which he joined the Continental Companies in Long Beach.

While with the Continental Companies, which companies were organized and very successfully headed by Bob New, he was responsible for the drilling of the largest group of high angle holes ever drilled by any oil company.

Mr. Broumley's many friends will extend best wishes to him in his new operations for Bob New Incorporated.

Luboviski Holds Important Post With Assn.

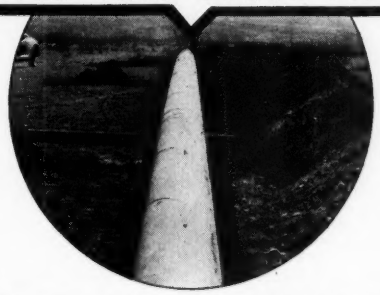
Jerry Luboviski, former city editor of the Los Angeles Daily News and the San Diego Daily Journal, has been appointed public relations representative of the Western Oil and Gas Association, it was announced recently.

Headquarters are in Los Angeles. The Association represents approximately 90 per cent of the oil industry on the west coast.

Jerry Luboviski

For two years prior to taking over the city desk on the Journal and then the Daily News, Luboviski was assistant director of public relations for North American Aviation, Inc. He also was with the United Press, working in the Los Angeles bureau, and worked for the Los Angeles Examiner.

SLACK LOOPS ARE EASY WITH THIS STEEL PIPE



The flexibility of ARMCO Spiral Welded Steel Pipe permits all standard slack loops and there is no danger that the pipe will buckle or become unstable.

Other advantages include lengths up to 40 feet and a wide range of diameters and gages. With long lengths there are fewer joints to assemble, fewer sections to unload, haul and string. Beveled pipe ends make for faster, easier field welding. Write for prices and other information.

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Your nearest CAVINS representative will show you how to remove lost rock bit cutters from your well—the easy way! When these conditions stall your job, CAVINS equipment will get you back into production in record time—and at lower cost.

Let's talk it over today!

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CALIFORNIA BRANCHES: Bakersfield, 1120 33rd Street—Telephone 6-6860 • Taft, Supply Row and County Road—Telephone 1127 • Ventura, 1641 North Ventura Avenue—Telephone 6767 • Santa Maria, Route 2, Box 239-N Newlove Drive—Telephone 1210-L

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Use the BAKER Cement Wash-Down WHIRLER Float Shoe

(Product No. 120)

A SEAMLESS STEEL SHOE in which a strong concrete plug and plastic valve assembly are securely anchored.

ACCURATELY CUT THREADS to fit any style casing.

A PLASTIC BALL VALVE to seal instantly against a resilient valve seat.

BAKER-FORMULA CONCRETE and *granular* plastic; easily drillable.

WASH-DOWN WHIRLER PORTS whirl cement slurry to provide uniform encirclement of casing with cement.

AMPLE CIRCULATING PASSAGEWAYS for hole conditioning and cementing.

Whirling action reduces hazards of channeling.

Whirling action, plus jetting action, removes bridges and conditions the hole.

YOU WILL FIND *ALL* THESE FEATURES *ONLY* IN THE

BAKER

CEMENT WASH-DOWN WHIRLER FLOAT SHOE

(Product No. 120)

T. A. Atkinson and E. R. Paul have been promoted to the respective posts of manager and assistant manager in General Petroleum's industrial relations department. Atkinson formerly was assistant manager of industrial relations. Paul has been assistant manager of the personnel department.

Robert W. Adams, laboratory technician for Ethyl Corp., is new branch manager of Ethyl's gasoline testing laboratory at San Bernardino. He succeeds Charles A. Rankin, who has been transferred to Tulsa, Okla.

LeRoy Edwards, Los Angeles gas company executive, has returned from a visit to New York and other eastern points.

Col. D. D. Stewart, Lexington, Ky. capitalist, owner of oil ground in the East Los Angeles area, is represented in California by Jack Farrell, widely known member of the petroleum industry.

Otto Mauthe, popular public relations manager for Southern California Gas Co., was a recent business visitor at New York, where he conferred with members of the Manhattan press.

James E. Hill, Union Oil Co. training and safety supervisor; and Rex Thompson, Standard Oil Co. training supervisor at the El Segundo refinery, discussed modern techniques and operator orientation and training at the meeting of the California Natural Gasoline Association. The meeting was held in Union's refinery cafeteria at Wilmington.

Lured by desert air and sunshine, Dan Dunlap, Long Beach oil man, was a recent vacationer at Palm Springs, where he gained an enviable tan.

F. E. Attig has been appointed sales supervisor for Tide Water Associated in the Southern California district, and Boyd H. Mackey, assistant to the sales manager in the Los Angeles district.

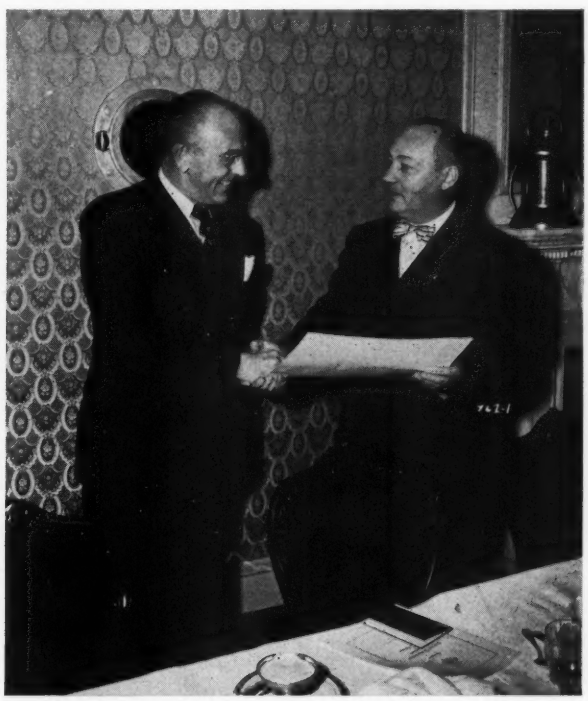
Appointment of B. J. C. van der Hoeven as a vice president in the chemical division of Koppers Co., Inc., has been announced by Dan M. Rugg, vice president and general manager of that division.

Charles S. Garvin, resale sales manager in the Sacramento division for Shell Oil Co., has taken over the duties of assistant manager of advertising and sales promotion. He succeeds Frank M. Chapman, who resigned to establish an advertising agency.

Benjamin A. Moyle, Long Beach oil operator, is a candidate for election to the Signal Hill city council.

Wedding bells rang out the other day for Jonquil Berry and William Russell Wardner, Jr., son of the guiding light of the Conservation Committee of California Oil Producers. Upon their return from a honeymoon trip, the newlyweds will make their home in Corona Del Mar. The bridegroom is an alumnus of USC.

Pictured above are the foreign guests at the March meeting of the Los Angeles Chapter of Nomads. Seated, left to right: Jean P. Lacroix of Regie Autonome det Petroles; S. L. Slaughter of Tropical Oil Company and A. F. Driskill of Iraq Petroleum Corporation. Standing, left to right: A. C. Bush of Drilling & Exploration Co.; H. E. Johnson of Drilexco and F. R. Wilmer of C.P.C.—Maracaibo.



At the March Meeting of the Los Angeles Chapter of Nomads, Nomad Ted Sutter is shown presenting the honorary membership certificate to E. C. (Ned) Brown.

Hurst Steps-Up at Tubbs

After a quarter century of service, Tubbs Cordage Company announces that Clyde H. Black, their representative in the Mid-Continent and Gulf oil fields, has gone into well-earned retirement.

Robert P. Hurst

Working out of Tulsa, Mr. Black has long been a familiar figure in the fields and an acknowledged authority on the usage of oil well cordage.

Black has retired to his home at Bentonville, Arkansas.

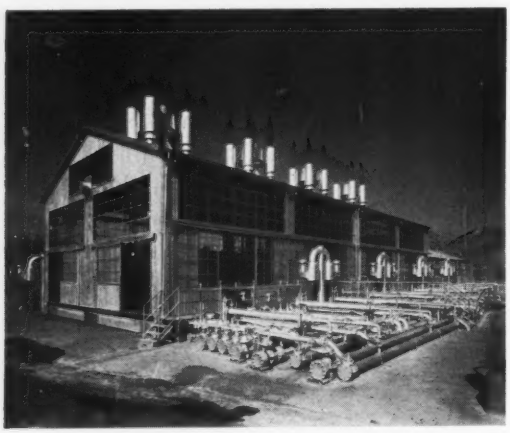
Replacing Black in the Mid-Continent and Gulf fields is Robert P. Hurst, who will have his headquarters in Houston. Hurst will work closely with the Bethlehem Supply Company organization, Tubbs distributors in this area.

According to Mr. W. I. Atherton, Sales Manager for Tubbs Cordage Company, Hurst is thoroughly familiar with the cordage requirements of the oil fields through his work under Black. He has also spent considerable time in the Tubbs Mills in San Francisco, familiarizing himself with the manufacture of cordage from the fiber on up.

CNGA Members Attend NGAA Meeting in Fort Worth

Sixteen members of the California Natural Gasoline Association returned last week from the NGAA Spring meeting held at the Texas Hotel in Fort Worth, March 24-26th. Those attending from California were: W. A. Kirk, California G.A., R. D. Gibbs, Union Oil Co., Southern Oil Co., Vice Pres. of C.N. Vice-Pres. of NGAA, Clare Gard, Union Oil Co., E. P. Valby, Richfield Oil Corp., Chairman of CNGA Technical Committee, J. B. Taylor, Signal Oil & Gas Co., Fred Loomis, Standard Oil of Calif., Walter Dayhuff, California Research Oil Corp., Warren Kraft, Honolulu Oil Co., Ed Ragatz, Glen Gill and Harry Marsh of J. B. Gill Co., J. A. Richardson, Bechtel Corp., Bob Fluor, Earl Dunn, J. G. DeFlon, and Jim Wiseman of Fluor Corp. and E. R. Millett, Jr. Secretary-Treasurer of C. N. G. A.

The meeting was opened by C. R. Williams, Chicago Corp., President of N.G.A.A. by extending a cordial welcome to the 952 registered guests representing the Natural Gasoline industry from throughout the country. The papers read were of excellent quality covering Cycling Operations, Economics, Motor Fuels and being concluded with the "Information Please" Ses-



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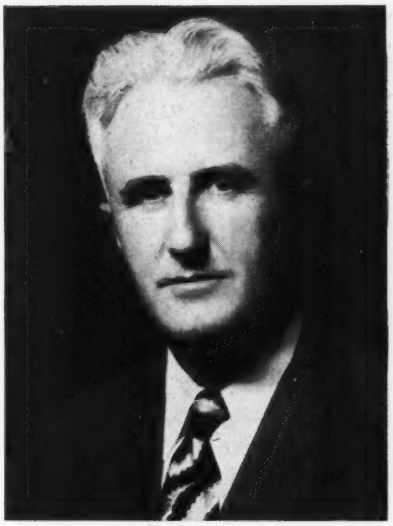
sion, which is a discussion of questions submitted by those present by a panel of experts representing the many phases of the industry.

A non-technical session was well received by the hungry guests at "The Chuck Wagon" on Thursday evening which was sponsored by the Natural Gasoline Supply Men's Association.

Progress is the American Way of life. The petroleum industry IS progressive.

Greater petroleum production is sought by the Government. Interior Secretary Krug has requested the cooperation of Governors of major producing states to boost oil output to a maximum. The Secretary asserted that needs for the armed forces, motor and tractor fuels next winter call for additional suplies. He emphasized that any increase in production should be in conformity with sound conservation practices.



PAUL ARMSTRONG
Program Chairman
California Natural Gasoline Assn.

Providing programs of a high calibre every month is quite an assignment. But, Paul Armstrong is one of those vivacious individuals who takes these problems and does a whale of a job.

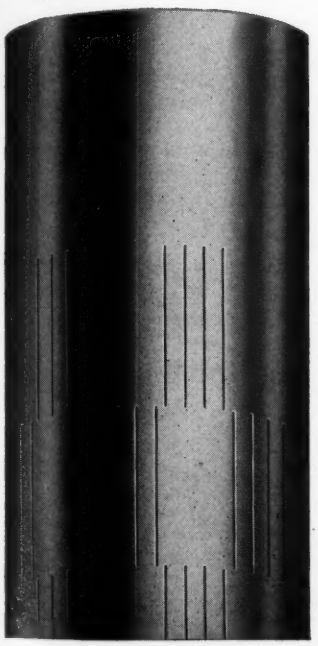
In addition to being distributor for the Union Steam Pump Co., and an active member of C.N.G.A., Paul is a member and past chairman of A.S.M.E., member of the American Society for Metals; member of the National Hydraulics Division Subcommittee on Positive Displacement Pumps and Motors and the American Society of Military Engineers. He is a California Licensed Professional Engineer and a Special Lecturer in Mechanical Engineering at the University of Southern California.

Those of you who know Paul Armstrong know that his hobby is pumps. Henry Wade has a story which very well illustrates this. He was traveling in Texas, where he met John Lynch of the La Gloria Corporation.

Henry said, "John, do you know Paul Armstrong?"

John replied, "Yes, I know Paul Armstrong. He can talk about other things but he would much rather talk about pumps."

F. E. Gober has been assigned contract to drill a well for Lucky Seven Oil Co. near the intersection of Highland and Mariposa streets in the Richfield area.



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. . . saves time and money

Pacific Slotted Pipe with either Keystone Slot, Standard Straight Slot, or Fine Gauge Slot—and threaded with the exclusive Ventura Flush Joint Thread — provides users with the advantages of dealing with ONE reliable source.

This "two-in-one" service — pipe slotting and threading — saves time, trouble and money for the buyer and keeps the responsibility for both of these important precision operations under the supervision of one dependable company. Pacific has had many years of active experience in this type of work and, together with expertly trained personnel, offers fast, efficient service.

When planning for slotted pipe requirements, you can always depend on Pacific for better results. Address your inquiries to:

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Main Office and Plant:
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Branches are also maintained in Bakersfield, Taft and Ventura

White Advanced by Franks Mfg. Corp.

R. M. White

R. M. "Dick" White has been elected vice-president and appointed sales director of Franks Manufacturing Corporation of Tulsa as of April 15.

White, who has been Franks district manager at Fort Worth, has been with Franks since 1934, except for a brief period with the Noble Drilling Co. as "rough neck" in the field, and with the Oklahoma Iron Works as rotary rig engineer.

Hs was born in Cincinnati, Ohio in 1899 and took his education in three colleges, the Spring Hill Preparatory College in Mobile, Alabama, at Tulane in New Orleans, and at Notre Dame where he majored in engineering.

Following college, White became a salesman for and part owner of the C. D. Gott Company of Chattanooga, Tennessee, and was salesman for the Aberfoile Manufacturing Corporation of Chester, Pennsylvania before joining Franks.

White has spent most of his time with Franks in the sales department. He established the Fort Worth office and for years covered all of Texas, New Mexico, Lousiana, Mississippi and Arkansas.

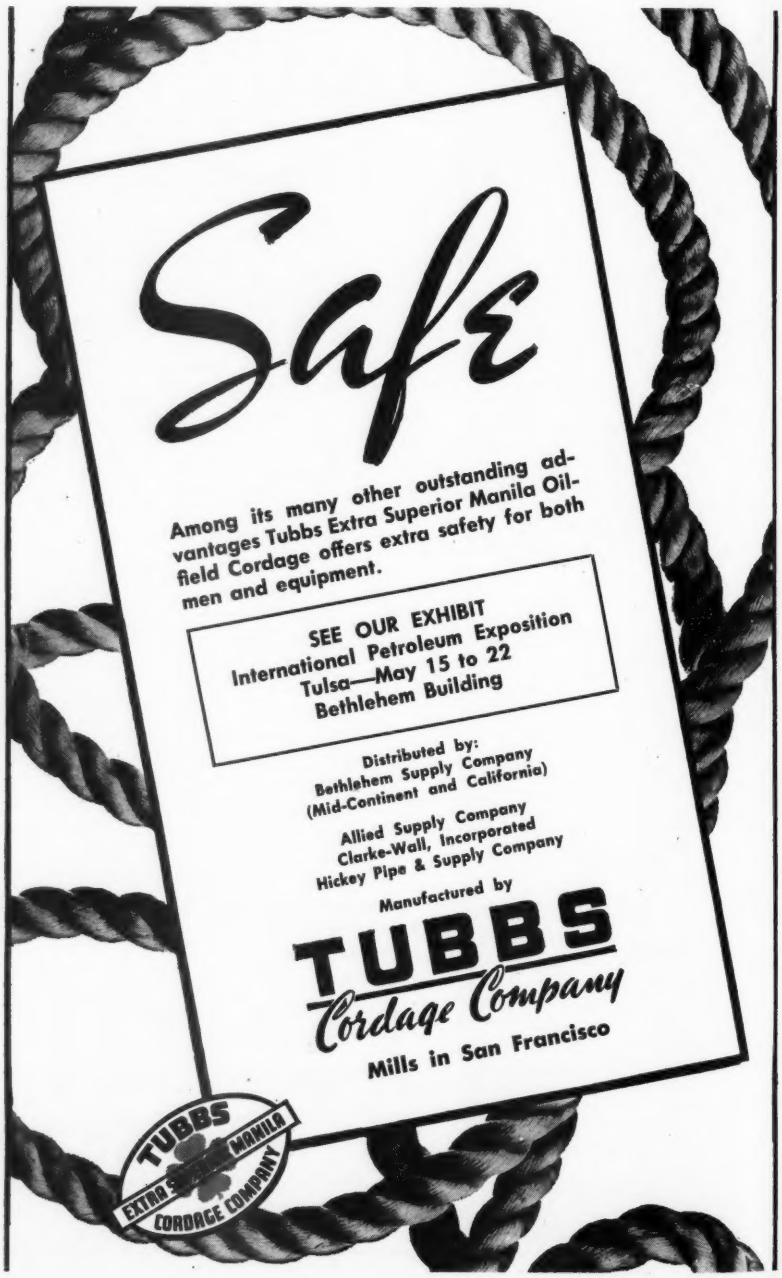
During the war he served as Franks' Washington representative, reestablishing the Fort Worth office following the war's end.

"A Mineral Policy for the United States," was the subject of an address by Dr. Donald H. McLaughlin before the dinner meeting of the Southern California section of the American Institute of Mining and Metallurgical Engineers. Dr. McLaughlin is a vice president of the AIME and was formerly chairman of its committee on geophysics. He is president of the Homestake Mining Co. and vice president of the Cerro de Pasco Co.

A palate tickling venison dinner party was given at Richfield for R. L. Davis of Texas Co., who was transferred to the Coalinga area, and N. L. Hamner, who retired. Both of the Texaco members were presented with gifts.

William Sopher, Union Oil Co. industrial service representative, was the guest speaker at a meeting of the Lions Club in Riverside. The meeting also was featured by the conferring of an eagle scout badge on Michael Lanning. Michael, 15, is the son of Francis S. Lanning of the Union Oil family.

Andy Wolfe, captain of the University of California basketball team, is the son of William D. Wolfe, assistant chief draftsman at Shell Oil's Martinez refinery. Andy is the first California player ever to score more than 1000 points. According to coach Nibs Price, Andy is "the most outstanding player I have ever coached."



THIS LAUGH OFF!!

A group of sailors on a freighter were frequently entertained by one of their number, a slight-of-hand performer of no mean ability, during the long evenings at sea. His act, in which cards, money and handkerchiefs were made to disappear, was enjoyed by all aboard—except one—a parrot which greeted each performance with a raucous "Ha, ha, ha! Phooey!"

The ninth night out, in the midst of the show, a terrific storm arose and the boat sank. The prestidigitator was thrown into the ocean and managed to grasp some wreckage to support his weight.

The following morning he was startled to see his critic, the parrot, sitting on an upright on his improvised raft. Not a word passed between the castaways for two days. Suddenly, however, the parrot looked down, cocked his head to one side, and with a gleam in his eye demanded:

"All right, what'd you do with the ship?"

The elderly lady, unused to the way of pay phones, was having a battle with the instrument and was asking numerous useless and unnecessary questions of the operator.

Finally, when she was through, she spoke to the operator: "You have been very nice in answering questions. I am going to put an extra nickel in the box for you!"

"I don't mind you makin' a living off me, Chum. I just hate to see you do it ALL AT ONCE!"

The old man noticed the young fellow with a bottle in one hand and his arm around a pretty girl.

"The dern whippersnapper is wastin' a lot o' time," he mused. "He can drink when he gets old."

New resident—"How long must a man live here before he can vote?"

Town clerk—"What ticket?"

"I would use it myself but I don't LIKE hair!"

Mother (to her young son): "Whose little boy are you?"

Son (disgustedly): "Gosh! Don't tell me you don't know."

"Heck," exclaimed the contractor as one of the new houses collapsed. "I told those carpenters not to take down the scaffolding until after the wallpaper had been put on."

He: "And now I'm going to steal a little kiss."

She: "Well, let the crime wave begin."

The old time cattle thief now has a grandson who only pinches calves.

"Daddy, what is puppy love?"

"That's the beginning of a dog's life, my son."

Customer—"I wanna buy a lawn mower."

Clerk—"I'm sorry, sir, but we do not have lawn mowers."

Customer—"Well, this is a fine store."

Skeptical About JENSEN Units?

If you are skeptical about Jensen Pumping Units being able to cut production costs, look at the specifications. Then, compare with other units—weigh prices, operating costs—talk to Jensen users. Those who have used Jensens for as far back as 28 years can bring you up-to-date on Jensen's low operating cost, less upkeep and reduced production cost.

Jensen dealers are everywhere in the oil country. See them about your pumping equipment needs. No soft soap . . . hard facts, only.

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California Oil World's Monthly Summary

CALIFORNIA DEVELOPMENT AND PRODUCTION

	FEBRUARY, 1948 DEVELOPMENT				PRODUCTION	
	Active Drilling Wells	Oil Wells Completed	Initial Production B/D	Oil Wells Completed First 2 Months	Daily Average February 1948	Daily Average February 1947
SAN JOAQUIN VALLEY REGION						
Ant Hill					1189	1625
Antelope Hills					1278	1405
Bellevue					315	311
Belridge—North					3605	5081
Belridge—South	2	1	54	7	5911	10,215
Blackwell's Corner					142	214
Buena Vista Hills		1	59	1	45,831	48,902
Canal					1,942	2,021
Coalinga Group						
Eastside	1	3	186	7	18,453	16,210
Oil City					87	96
Coalinga—Nose					53,224	51 719
Coalinga—Northeast	1	1	853	1	8,982	8,007
Pleasant Valley					3,715	3,835
Jacalitos	2			1	4,841	4,209
Westside	4	5	177	5	6,867	6,771
Coles Levee—North	1	2	661	2	16,019	16,104
Coles Levee—South		1	192	1	3,248	2,738
Edison	2	3	685	4	10.925	12,143
Elk Hills	4			1	6 699	8,484
Fruitvale					6,520	6,690
Greeley					13,994	10,149
Helm					4,215	4,197
Kern Bluff		3	238	6	447	
Kern Front		6	219	12	9,195	8,979
Kern River	11	38	1207	69	11,771	9,829
Kettleman North Dome	4	2	1795	3	36 332	37,848
Lanare					1,462	2,463
Lost Hills	1	10	671	24	6,929	4,265
McKittrick Group						
Belgian Anticline	1				1,176	
Cymric	3	10	628	16	18,953	12,761
McKittrick					2,847	2,926
McKittrick Front	1			2	1,563	1,386
Salt Creek					5,752	3,965
Sheep Springs					1,157	372
Temblor Ranch					110	119
Midway-Sunset	4	8	467	16	42 653	42,988
Mt. Poso Group		1	55	3	12,793	14,907
Mountain View	2	1	15	2	3,939	4,447
Paloma	9	1	767	6	11,008	7,742
Poso Creek Group	2			3	3,471	3,693
Pyramid Hills					240	295
Race Track Hill	1	1	121	1	1,711	2,158
Raisin City					2,889	2,720
Rio Bravo					11,978	13,063
Riverdale					3 610	4,148
Round Mountain Group	2	5	278	6	7,617	8,762
Strand					811	1,481
Strand—East					494	509
Tejon Ranch	1	1	31	1	3,380	2,703
Ten Section		1	141	1	7,227	8,168
Union Avenue					338	348
Wasco					139	395
Wheeler Ridge					217	220
Other Fields	3	1	96	8	1,498	411
TOTAL—San Joaquin Valley Region	62	106	9596	209	431,709	425,197
COASTAL REGION						
Santa Maria District						
Barham Ranch (Los Alamos)					10	
Casmalia	1	2	15	3	848	333
Cat Canyon—East					388	262
Cat Canyon—West	3	3	476	6	14,130	10,750
Four Deer	1	1	18	2	596	
Gato Ridge					3,666	3,690

	FEBRUARY, 1948 DEVELOPMENT				PRODUCTION	
	Active Drilling Wells	Oil Wells Completed	Initial Production B/D	Oil Wells Completed First 2 Months	Daily Average February 1948	Daily Average February 1947
COASTAL REGION—Continued						
Lompoc	1	3	517	6	6 248	3,586
Olivera Canyon	1	.....	.....	.....	219	.....
Orcutt	1	2	152	6	4,861	4,395
Santa Maria Valley	1	1	181	2	21,569	29,202
Zaca Creek	1	2	202	2	795	394
Santa Barbara District						
Capitan	.....	.....	.....	.....	2,820	2,959
Elwood	2	.....	.....	.....	7,322	7,024
Santa Barbara	.....	.....	.....	.....	73	96
Summerland	.....	.....	.....	.....	.....	2
Ventura District						
Montalvo West	1	.....	.....	1	169	.....
Padre Canyon	.....	.....	.....	1	4,754	2771
Rincon	1	.....	.....	.....	3,339	4,100
San Miguelito	1	.....	.....	1	4,899	5,053
Ventura Avenue	5	4	2,306	5	50,096	45,218
North Santa Clara District						
Del Valle	5	1	112	3	9,603	7,635
Hopper Canyon	.....	.....	.....	.....	179	184
Oak Canyon	1	.....	.....	.....	2,047	1,690
Sespe Canyon Group	2	1	87	1	233	284
Temescal	.....	.....	.....	.....	567	613
Others	1	1	200	2	544	198
South Santa Clara Valley District						
Aliso Canyon	2	.....	.....	2	3,522	3,521
Bardsdale	3	3	465	3	648	404
Newhall-Potrero	5	1	400	1	7,262	6,279
Oxnard	.....	.....	.....	.....	1,695	1,230
Shiells Canyon	.....	1	28	1	1,015	1,068
South Mountain	5	.....	.....	2	4,887	4,479
West Mountain	2	.....	.....	2	1,089	236
Others	1	1	65	1	849	747
San Luis Obispo, Santa Barbara, Santa Clara and Monterey Counties	.....	.....	.....	.....	187	29
TOTAL—Coastal Region	47	27	5224	53	161,129	148,432
LOS ANGELES REGION						
Brea-Olinda	5	1	180	3	13,944	11,728
Coyote—East	1	.....	.....	.....	4,849	5,017
Coyote—West	3	2	374	3	15,929	15,170
Dominguez	3	.....	.....	.....	13,629	15,765
East Los Angeles	1	.....	.....	.....	1,110	983
El Segundo	.....	.....	.....	.....	446	478
Huntington Beach	17	27	2,034	49	54,271	49,403
Inglewood	1	1	57	2	11,377	11,858
Long Beach	9	2	207	3	23,199	24,324
Montebello	.....	.....	.....	.....	6,890	7,776
Newport	4	8	523	9	6,240	8,379
Playa Del Rey	.....	.....	.....	.....	2,014	2,165
Potrero	2	.....	.....	1	1,176	829
Richfield	.....	1	18	1	6,233	6,708
Rosecrans-Athens Group	1	1	435	2	4,776	4,800
Santa Fe Springs	1	1	35	2	15,700	16,350
Seal Beach	3	1	678	2	11,112	11,874
Torrance	.....	.....	.....	1	7,969	8,573
Whittier	.....	.....	.....	.....	956	1,006
Wilmington	10	15	4,367	42	136,051	122,081
Yorba Linda	2	.....	.....	.....	1,040	203
Other Fields	2	2	476	2	1,873	1,328
TOTAL—Los Angeles Region	65	62	9,384	122	340,784	326,798
EXPLORATORY						
Outpost Wells	38	.....	.....	.....	.....	.....
Wildcats	12	.....	.....	.....	.....	.....
Gas Wells	2	4	.....	12	.....	.....
TOTAL CALIFORNIA	226	199	24,204	456*	933,622	900,427

*Includes 60 drilling wells abandoned.

Kern County OIL NEWS

GENE VALLAT, DISTRICT GEOGOLIST OHIO OIL COMPANY, Chairman of San Joaquin Geologists Society should be head of the Chamber of Commerce in his community. The leadership part which he exemplified in helping the organization of the society of Exploration Geophysicists Pacific Coast Section has been a proving ground in this county, that qualifies such a statement.

KEYNOTE ON THIS REGIONAL SECTION Organization meeting of SEG was that it recognizes that finding and producing substantial additions to our oil and gas reserves is becoming increasingly difficult. The SEG has this in mind and the organization is designed to foster cooperation between various scientific and technical personnel in the industry who must work together for a successful solution of this problem.

OTHER ORGANIZATIONS WE MENTION HAVE PROVED it is always helpful to be able to informally discuss the various problems in the media of friendliness and good fellowship. For almost two hundred years the peoples of the North American continent have been able to do this in their affairs of state. The Pacific Coast Section of SEG is interested in the application of geophysics to the problem of mining exploration and it is hoped that those in this field also may be attracted to participation. Your scribe is proud to have a part in making this contribution to Kern County Oil News as perhaps a means of spreading the gospel to make known the County's resources. The best way to make known the oil resources is not so much by publicity, however, as it is by actually finding something and then telling about it.

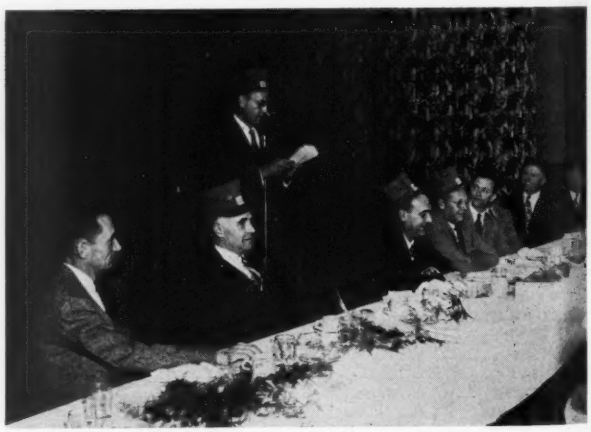
THE AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS since November 1945, have held organized meetings of this SEG group and usually in conjunction with the AAPG. It is the hope that formalizing the organization of this section will provide an opportunity for members of the geophysicists crews, geologists, petroleum engineers, and all other individuals interested in geophysics to be active in the organization.

MEMBERSHIP IN THE NATIONAL Organization of the Society of Exploration of Geophysicists is not a requisite to membership in the Pacific Coast Section, however.

THE BIG MEETING on March 11, at the Bakersfield Inn formalized the organization of the Pacific Coast Section and initiated a petition, directed to the counsel of the Society of Exploration Geophysicists for recognition by it as a regional section. "No wonder Kern County Oil News of COW is interested in and proud of this action." It's another first for Kern.

ELSEWHERE IN COW AND

INTRODUCING THE "SEGS": Pacific Coast Section, (Society of Exploration Geophysicists,) sometimes and more generally known as S.E.G. One SEGwig thought the election a "railroad" and furnished the caps. He turned out to be a SEGwag instead. Here are CURTIS JOHNSON the new president of PCSSEG, geophysicist . . . for the General Petroleum at Los Angeles; MILTON BORN, temporary chairman in charge of organization and "railroading," geophysicist AMERADA OIL Los Angeles; JOHN SLOAT, Geophysicist for Union Oil Company, Bakersfield; and E. H. (GENE) VALLAT, District Geologist for OHIO OIL COMPANY, Chairman of the San Joaquin Geologist Society and on the nominating committee for S.E.G.

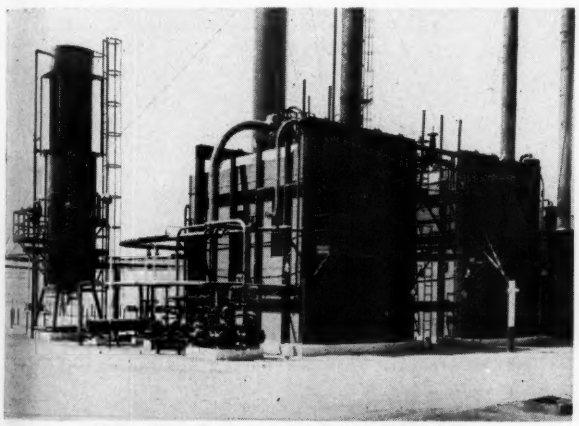


FROM ANOTHER ANGLE The Pacific Coast Section of S E G shows "railroad" night's full head table beginning with OSCAR VAN BEVEREN Geophysicist for Standard Oil Company at Bakersfield who did a big job with the constitution and by-laws committee as its chairman. President elect CURTIS JOHNSON; JOHN SLOAT still speaking; Roadmaster MILTON BORN; GENE VALLAT, TED ELLSWORTH, chief geophysicist of RICHFIELD OIL CORPORATION, Bakersfield; and LORING SNEDDEN, District Geologist for TEXAS COMPANY Bakersfield and Vice President elect of S E G.

GEOPHYSICAL SEGments: This left side of the head table (no pun intended) centers attention on WALTER ENGLISH, pioneer consultant. Others are: J. W. FLOYD, P. E. SWENSON, D. E. HILL, NORMAN KYLE, HERBERT KIM, GORDON W. BILL, CHARLES W. PORTER, JIM LATENSER, W. G. SMITH, CARL FOOTE, JAMES EVERETT—And at the extreme right is R. C. (BOB) DUNLAP, Pacific Coast Manager GSI (Geophysical Service Incorporated) new Secretary Elect of SEG.

WITH EYES RIGHT FROM THE RIGHT side are (left to right) as we can see them: DAVE HOBSON, District Geologist "GP" Company; PAUL CLEMENT, geophysicist Western Gulf; BILL BOOTH, consulting geophysicist (with magnetometer service); R. L. HEWITT, geologist Tide Water Associated; JOE LE CONTE, geologist RICHFIELD OIL; JOHN HALE, District geologist SEABOARD OIL; BILL YERINGTON, geologist OHIO OIL; TOM BIBB, geologist for TEXACO; DAVE SCOTT, geophysicist TEXACO (face averted) FLOYD WILLIAMS, Explosive Engineer for Hercules Powder; "HUNT" HUNTER, unattached "DOODLE-BUGGER" who had a bad time but held his own good naturedly.

KERN COUNTY OIL NEWS is a display of candid, and friendly photographic record of the meeting and officers elected: President, **Curtis Johnson,** General Petroleum Corporation; Vice-Pres., (Northern) **L. B. Snedden,** Texas Company; Vice-Pres., (Southern) **N. W. Harding,** United Geophysical Company; Secretary-Treasurer, **R. C. Dunlap,** Geophysical Service, Inc.; Executive Committee, **C. C. Lester,** Jr., Retired, Amerada Petroleum Corp.; **Henry Salvatori,** Western Geophysical Co.; District Representatives, **John Sloat,** Union Oil Company of California; **Dean Walling,** Western Geophysical Co.



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POINTING UP THE PROBLEMS BEFORE THEM: "Oil Well Drilling" . . . One hundred and ten Contractors from the local chapter of the A.A. "ODC" held a record meeting at CRYSTAL INN in Bakersfield last month. Here are AAODC's Vice President—California Chairman D. H. (Doug) GRAHAM of Dunlap and Graham: National Proxy E. C. (Ned) BROWN of the Drilling Company by the same name; and BRAD MILLS, Executive Vice President of "AAODC" Dallas, Texas.

CALIFORNIA CHAPTER OF A.A.O.D.C. had Tine Gaiser from TINE GAISER Drilling & Production Service on US 99, as its Dinner Arrangements Program Chairman seen on the far end. PUG YORK of Miller & York is next to him, followed by: KARL KELLOGG of K. L. Kellogg Drilling; J. E. BRANTLY of Drilling & Exploration Company; ED STEELE, Manager of Oil Base, Inc., who talked of mud and mud schools; A. S. (DOC) HAYES of Hays & Sprague, who presided: W. F. (Frank) JONES, new secretary of California's AAODC Chapter: and DOUG GRAHAM.

PRESS RELEASES regarding the meeting and several press resources were excellent but could not do justice to describing the results of the meeting. One would have had to be present, and as fortunate as we, to realize the stature of the organization and the precepts of the Society. It was indeed a large audience, a contribution to the oil industry, and the county of Kern regards it as a first along with the first county in Oil.

AMERICAN ASSOCIATION OILWELL DRILLING CONTRACTORS who met in Kern County's CRYSTAL INN at Bakersfield were proud of their attendance of 110 members who were about equally divided between lower and upper Southern California.

THE CRYSTAL INN WAS ANYTHING but what the name might imply because all thoughts were directed to mud . . . but even

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some mud was Crystal clear before the meeting adjourned.

AAODC'S NATIONAL PREXY Ned Brown was there and Doc Hayes presided as Chairman of the California Chapter. Ed Steele from Oil Base Inc. was guest speaker and revealed a number of qualifying reasons for mud processes which were responsible for bringing in top flight wells that otherwise have often been lost or impossible to bring in.

DEMANDS FOR ENERGETIC action on "Operation MUD" has resulted in forming mud schools according to ODC wigs (Oilwell Drilling Contractors) who met recently in Bakersfield. In Long Beach the city college set up a course in Drilling Mud, at the John Dewey Vocational School, 8th and American Streets. This is the place; The time is 7:00 to 9:00 pm Monday through Saturday the first week, and Monday through Friday the second week. Neal Thompson, Baroid Sales, assisted by Dr. C. D. Barnes of Long Beach City College. ALL IN COOPERATION WITH AAODC. The course is two weeks with six days 1st week and 5 days 2nd week. Matriculation Fee is $3.00 for the the entire course. All are eligible from "ruffnecks" to "engineers" and owners. A sheepskin will be awarded those who pass.

KERN COUNTY'S Bakersfield City College may be next according to plans now in the developing stages.

PLANS AND ACTIVITIES OF "ODC" reviewed by the directors presenting emphasis upon California problems were: E. C. (Ned) Brown, D. H. (Doug) Graham, J. E. Brantly — Brad Mills, Karl L. Kellogg, Gene Reid and Ralph Marshall. Frank York, Tine Gaiser, and E. A. Bender were in charge of arrangements.

J. E. BRANTLY's Resume of AAODC organization begun in 1940 as a needed committee on operation standards benefitting the oil operators and drilling contractors. The fact that it grew to a National Organization was not exactly an accident. The demand and resultant effort of trying to work together for the greatest common good to the greatest common number gave "AAODC" an international recognition. Another notch in the measurement yardstick of the oil industry's success in every undertaking when left alone to do so, this spells out proof of the American Enterprise System which works profitably to the greatest number without hardship and destruction of freedom.

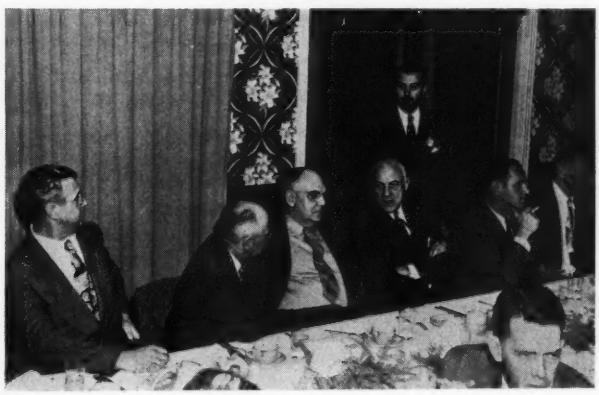
"TO THE OIL COUNTY . . . and part of the FARM COUNTY OF KERN The rains came gently, and they did not disturb the "spudded-in" and derrick rigged earth." This slight improvision from a famous author was borrowed this month by writers with such headlines as "the rains came."

AND TO THE McKITTRICK COUNTRY the fires came for there were two of them at Texas Company's natural gas well. One on Wednesday spouting a flame that was visible by day and night from U. S. 99 as a 170 foot rope of fire. Then on Friday it blew out again. Ford Alexander was on hand and Texaco asbestos suits were issued. Kern's famous fire fighting equipment "stoodby" to prevent aggression for other property. It was something new for the young and something old for the pioneers.

JAMES J. (TEX) WAGNER wealthy retired pioneer of Tehachapi, friend of the oilmen and oilworker alike . . . passed away at his home following a visit with friends in Bakersfield last month. In ill health for some time the end was, however, not expected so suddenly although Tex said he was ready.

FIFTY YEARS AGO 20 hacks were necessary to accommodate the train business in Kern County according to the "Californian." Half a score of Taxis do it now but it is not true that only one taxi handles it, it only seems that way. The packing system is still in vogue.

MIXED FOURSOMES AT ODC'S CENTER REAR TABLE: Your favorite Drilling Contractor is associating with your favorite Tradesman. The "Trade" supplies everything but the income tax and some can save you money on that. These "Siamese Twins," however, need each other. Here are some of the combinations readily seen: CHARLES DUKE OF FMD (Fowler, Menver and Duke); "TOMMY" THOMPSON, of T & T DRILLING: TRACY HARKNESS of his own: JOHNNIE GRANT of LOFFLAND BROS.: TOM JENNINGS of ROCKY MOUNTAIN: JIM CONLON of BAROID: COTTON HOLDEN Superintendent of LOFFLAND BROTHERS DRILLING and friends.



TINE GAISER TAKES INVENTORY OF ODC. Head Table Attendance while Maitre "D" Frank Cappi confirms . . . Sitting to Tine's left are MILLER & YORK'S "York"; K. L. KELLOGG'S "Kellogg"; OIL DRILLING INDUSTRY'S "Brantly" who fathered the AAODC idea on one of his international tours where he had some time thinking over the airways monotonous trip to Turkey; OILMUD'S "Ed. Steele" and HAYES & SPRAGUE'S "Doc Hayes."

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HUGH ALLEN a mining engineer located at Barstow visited relatives in Rosedale forty years ago, so reads the Californian. We add that the Hugh Allen we know, now is head of the Kern County Land Company and it wasn't **mineral** but **oil** that was found on holdings around the County called Kern.

CLARENCE WILLIAMS former Mayor of Taft was showing motion pictures at Fellows Twenty Years ago before the American Legion members. Many enjoyed the scenes of Paris which Williams had returned to take after World War I.

KERNOILWIGS were a little confused this month when DON E. GILMAN, executive vice president of Western Oil and Gas Association reported oil shortage, "more mental than real." And "a supply far beyond the life-time of anyone today," that, some "oilperts" risk supply estimates, of 2000 years. President Merle Becker of the IPPA thought "proven - reserves" were made by drilling operations in 1947. API shows 614 million barrels in oil reserves by 1947 year's end. The nation now has a backlog they say of 21,500,000,000 barrels of crude reserves according to Becker.

IN KERN THE CONSERVATION story is pretty well known and every one is trying to be of course a gentleman with the agreement by the same name. And Paul Howard as well as Al Fritsche also talk of a possible OIL DROUGHT . . . while the great "Uncle" seeks more preparation for withdrawal of more oil land. Elk Hills is in for another tap on the drilling shoulder of about 2480 acres more and some say private enterprise is agreeing in public interest.

KERN'S OIL GENTRY HAVE always chalked up firsts when it comes to Red Cross contributions . . . it started way back in Harry Hopkins time when he suggested the name of "Moron" be changed to "Taft" in 1910 when he was Mayor and William Howard Taft was President.

FRANCO WESTERN OIL COMPANY this year was first to subscribe. White Shrine consisting of many oilwigs and wives was first

to donate. TOM MOODIE and PAUL GREEN first business district collectors in Taft to complete their canvas. B & M OIL Company first employee group to complete collections. L. D. Banderob of BELRIDGE was advance gifts chairman and first northwest Kern oilman to be so honored.

IUPW (Independent Union Petroleum Workers) held their second instructional meeting for administrators and stewards of the organization, according to A. R. Hurley the business agent. Over 60 delegates from the valley attended.

BETWEEN THE OIL WELLS at Edison, Rosedale, Shafter, Wasco, Arvin and every place else almost ten thousand more acres of Irish Potatoes were already planted this first day of April. Some of the individual, farmer, entrepreneurs, are not satisfied with what they get from "down deep below" but they want the surface benefits as well. And well, well it is, for someone has to feed the hard working peoples of the world so they can buy oil and drive cars for business and pleasure.

MUSICAL HIT author is Charley Manley who took time out from close of a big day with the OIL FIELD CONSTRUCTION COMPANY to properly relax with composure before the Manley Knabe. And Mr. We mean composure. "A LASS FROM ALASKA" got the biggest hand at the recently held "FOLLIES" at the FOX THEATER Womens' Club annual benefit. Encores came in for the hit as people delighted in the new tune, new melody and rhythm of the class number and its "Esquimo" prologue of snow Igloo(oo-ooo) scenes. Charley was in the audience and received a grand ovation.

KERN OIL PEOPLE were grateful for many organizations backing up the Tidelands Bill. Especially the State Chamber of Commerce which called for action on the Senate and House measure. Sovereignty over this land is about to be expressed in terms of a Centennial and Kern is interested because it has great faith in the pattern of development left by its pioneers who withstood hardships which made California possible. "Our interests seem to be unselfish and relative to others in the preservation of freedom of enterprise that made Kern County great . . . so that all might share in its wealth of diversified opportunity," said one oilwig.

POWER CONSERVATION which is caused by water shortage got off to a bad start with the oil people when "dumping" switches (to avoid burning out over loaded transformers and transmission lines,) sanded up many an oil well. One well down on Dana Hogan property according to McCay was out three days. All has been corrected now.

ALL YEAR CLUB of Southern California came to Kern last month to review the damage . . . not by talk of drought or drought itself but by pictures which appeared . . . in some papers. News-hawks reported that the blight was not as bad as they thought it was, "it was worse." Dead trees without foliage this time of year can be found in the same terrain during flood years.

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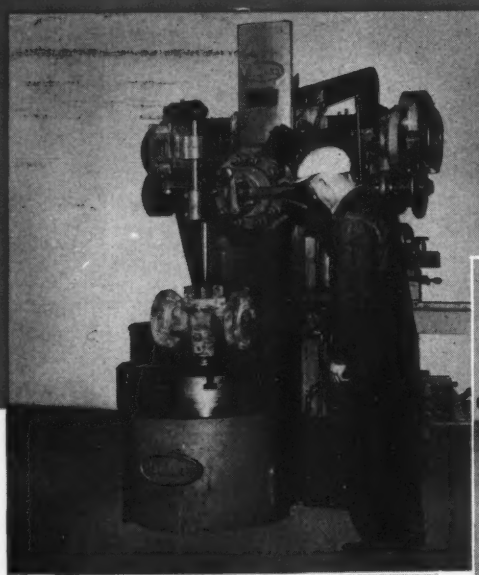
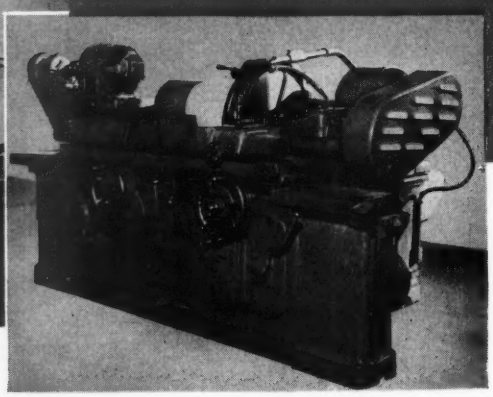
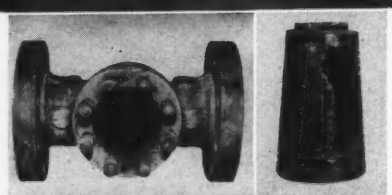
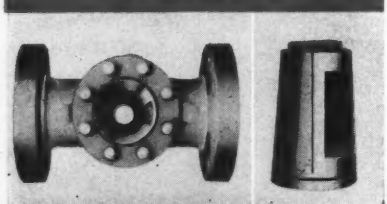






BEFORE—Badly worn valve and plug, typical of those brought in for rebuilding at Johnson Valve Shop.



AFTER—Valve Body, rebuilt and ground to specifications. Valve Plug, rebuilt and hard-faced with No. 6 Haynes Stellite, and precision-ground to specifications.

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Oilmen have a stake in the Kern County's fortunate opportunity to ride in on a half million $ publicity campaign to induce tourists to Southern California. Once here they ("the three million new ones every year") buy a lot of oil and gas . . . Sooner or later they travel U. S. 99 and Kern County.

Our "All Year Club" ride up here is almost free and during the war Kern County did not pay its "duck-pond" dues but kept right on hunting which was very good. Its biggest crop was 15 new pilots a day and many of them (6 out of 10) came back here if they found the "gal" or the "oilwell" they discovered—still waiting for them. Never mind "housing."

YOUR SCRIBE has $70.80 as a result of putting in $4.72 per week in the OILman's bank of Oildale since January 1, 1948. Kern County Bank will make a lot of friends on "T" DAY when week No. 209 turns up, in 1951 or sooner with $1000.00.

HOWARD DALLIMORE has been appointed Manager of Taft Chamber of Commerce succeeding Vern McLeod. Howard is a well known and extremely well liked boy from the Westside oilfields. His dad worked with Harry Hopkins for a long time. Later sold insurance and real estate. Howard used to have a band . . . still does a little "fiddling" . . . anyhow he is a darned nice fellow and while one does not have to be a N.F. to be a good chamberwig it does help during the parade for more money from more business. Born in oil he speaks and plays and interprets the jargon of the field and whatever it takes to make up the industry. Good luck.

KERN COUNTY IS TO HAVE . . . A Pageant . . . everything from the time the Union soldier stepped into asphalt at McKittrick in 1864 to the animated horses head that now takes the stall hard by Rose Station where Butterfield stages once bedded down their horses for the night.

OILMEN AT PUBLIC HEARING on Kern's new road system as explained by B. O. Webber new Road Commissioner of Kern County, were in good attendance recently. Since registration of automobiles, trucks and trailers have a lot to do with state funds for Kern road improvements a new drive is on to have oil firms register all of their trucks here. It is shown by your scribe that money can be saved and great benefits accrued if the seven or more thousand trucks that operate here the year round could be registered here. OIL·MEN TAKE NOTICE.

DEEP HOLE "CHUCK" McKEE . . . well, you all have heard of him. BUT how about his hard working brother "VG" who is co-owner of Bakersfield Pipe & Supply. "VG" is going to be heard about a little more even if he does sell a few oilwell supplies in competition with brother "Chuck" over at Taft.

BIGGEST IMPROVEMENT in a vastly expanded office we have seen recently and since "VJ" is Western Oilfield Supply Company's new administrative headquarters on U.S. 99. We were surprised and pleasantly.

JEAN PHILIP (we like the way he spells it) invited us to his "OPEN-HOUSE" on the 16 & 17 of April when **National Supply** goes into spacious new quarters. By the time you read this it may have been housewarmed and opened.

TINE GAISER, there's an oil-wig for you, and he has his own well . . . that is his wife does and he calls them by her name . . . Ferne

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Oil Company. Tine (Pronounced Tiny and **well** named) was a kind of interlocutor for the "ODC" banquet arrangements when the drillers held an open meeting at Crystal Inn last month. He did a most excellent job . . . called everyone of the drillers up a couple of times. The "ODC AFFAIR" turned out to be a record breaker for excellence in attendance. The principal subject was mud but some of the members on the other team had it mixed up with "mud-in-your-eye" and that helped the circulation immensely.

FRANK HORNKOHL . . . Colonel to us (a hangover from his World War II assignment) just opened the finest chemical and oil consulting laboratory in the San Joaquin Valley. Another hometown boy that made good in the community, the army and in postwar. As a hobby Frank plays the piano and civically he thoroughly enjoys the Rotary and several vocational societies as well as the Chamber of Commerce.

REQUESTS FROM ALL OVER the nation keep coming in for a sample of oil . . . a tiny oil derrick and a pump. a tank or refinery for a souvenir. Is there a model maker in the oil industry with plastic manufacturing ability or "know-how"? Get in touch with COW Kern County Department.

STANSBURY OF STANSBURY tells us that 150 oil souls and oilsoaks are going to Tulsa next month May 15 to 22 to see the IPE (International Petroleum Exposition) bi-annual event. Russell Rhodes of the Tulsa C of C doesn't have even six twin bedded rooms available anywhere within a hundred mile radius of Tulsa . . . WHO'S GOING BACK TO TULSA?

"KTKR" TAFT is the new radio station in the oil capital of Kern County. This probably is the first location of an oil city radio station. The first one was located on the Taft High School grounds way back in the early twenties at the beginning of the historic oil workers strike in Taft. Broadcasting was not resumed until this year when new inventions proved an aid to more profitable returns from the enterprise.

BILL BARBAT of San Francisco assistant geologist for Standard Oil of California is back in Washington . . . "DC" that is . . . listening to and supplying technical information to the Elk Hills hearings which have been going on for the past fortnight. We were talking to Herm Weddle who also said Bill was back in town the other day before he took off for the U.S. capital. Bill used to be a Taftian but his influence for good made him a Kerncountian when he completed his term on the County Planning Commission.

OWEN JOHNSON OF JOHNSON VALVE reveals another service demanded from the oil industry by other manufacturing enterprises. They located here knowing the value of precision instrument repairing necessary and efficiently in producing oil. This demand caused Johnson Valve to expand its shop. Owen pointed over to a department with 15,000 pound hydraulic testing pump, a 10,000 pound dead weight tester, a 50 inch mercury monometer, a mercury ounce gauge and varied reducing regulators. And we found a real instrument technician who is in charge of instrument testing and repairing pressure, vacuum and combination gauges, pressure recorders and highly sensitive pop and relief valves. "This is not all," said Owen, "our water meter prover is on its way for jobs ahead. You wear it out or tear it up and we'll fix it up." . . .

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BARNEY BARNES SUPERVISOR for District Three Kern County political subdivision (an oil area) was beseiged last fortnight ago for USA'S "First County in Oil Production" representation to Tulsa May 15 to 22 where the Petroleum Exposition takes place. At this writing Barney tells us that since there are no reservations we should try to make the EIGHTH ANNUAL MEETING AT HOUSTON October 11-13 with headquarters at the RICE Hotel through Chairman Howard Phifer of the L. D. Cain Drilling Company City National Bank Building . . . Subject is referral to "Curley" Stansbury — and other taxpayers.

KERN DRILLERS like W. F. (Frank) Jones their new secretary of the California Association Chapter of AAODC and asked your scribe to say that they'll be cooperating with the Halliburton ODC office in 404 at Los Angeles to help Frank increase drilling standards generally.

Progress is the American Way of life. The petroleum industry IS progressive.

Field Development

PREPARED FROM CALIFORNIA OIL WORLD NEWS SERVICE

Los Angeles Basin

Beach Wells Inaugurated

Several new drilling jobs are starting in the Huntington Beach area.

Denny W. Weaver, Garden Grove, is planning a well on his recently acquired 30-acre Farnsworth lease at the northwest corner of Hampshire and Indianapolis streets. He is reconditioning one old well on the lease.

E. J. Pope and Associates, meantime, is starting a well near the intersection of 14th and Orange streets. Sam Bernstein Petroleum Co. has under consideration two new wells at Huntington Beach and a third at Wilmington.

Hawthorne Drill Scene

Centinela Oil Co. has plans drawn for drilling its Centinela Valley No. 1 in the Hawthorne area. W. C. Hamilton is president of the company, Earl W. Stogsdill, vice president; and Victor Lunden, secretary-treasurer.

Berdoo Try Commencing

Grayco Oil Co., headed by J. P. Gray, is preparing to drill Grayco No. 2 in the Chino area of San Bernardino County. The project will drill 1250 feet northwest of No. 1 well.

Lawndale Try Staked

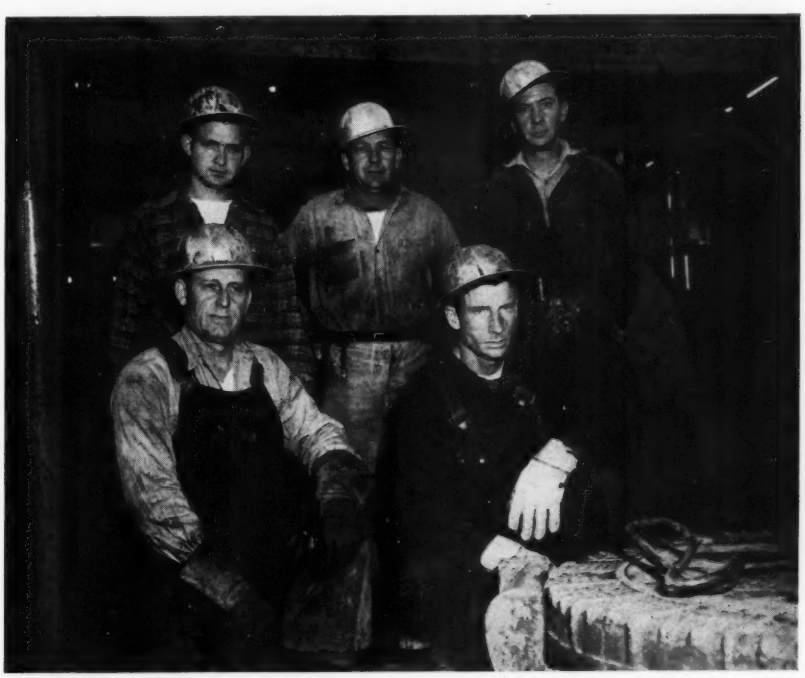
General Petroleum Corp. has started Powell No. 1, a test well in Sec. 21-3s-14w in the Lawndale area, where Seaboard Oil some months ago discovered new deep production. Cerritos No. 1 in Sec. 13-4s-13w at Long Beach is a new company drilling job. Industrial No. 1 in Sec. 8-2s-12w at East Los Angeles has been abandoned. Prospecting was carried to a total depth of 9285 ft.

West Newport Well Abandoned

Surfport Oil Co.'s Surfport No. 1 in Sec. 13-6s-11w at West Newport is an abandonment in gray sand at 3100 ft. D. D. and Dorothy Dunlap's new Aldrich Land Co. No. 3 at last reports was pumping at the rate of 225 barrels daily from 3142 ft. Macoil Corp. has completed Banning No. 15 and No. 16 in Sec. 20-6s-10w. The former established an initial output of 58 barrels from 1571 ft., and the latter, 22 barrels a day from 1745 ft.

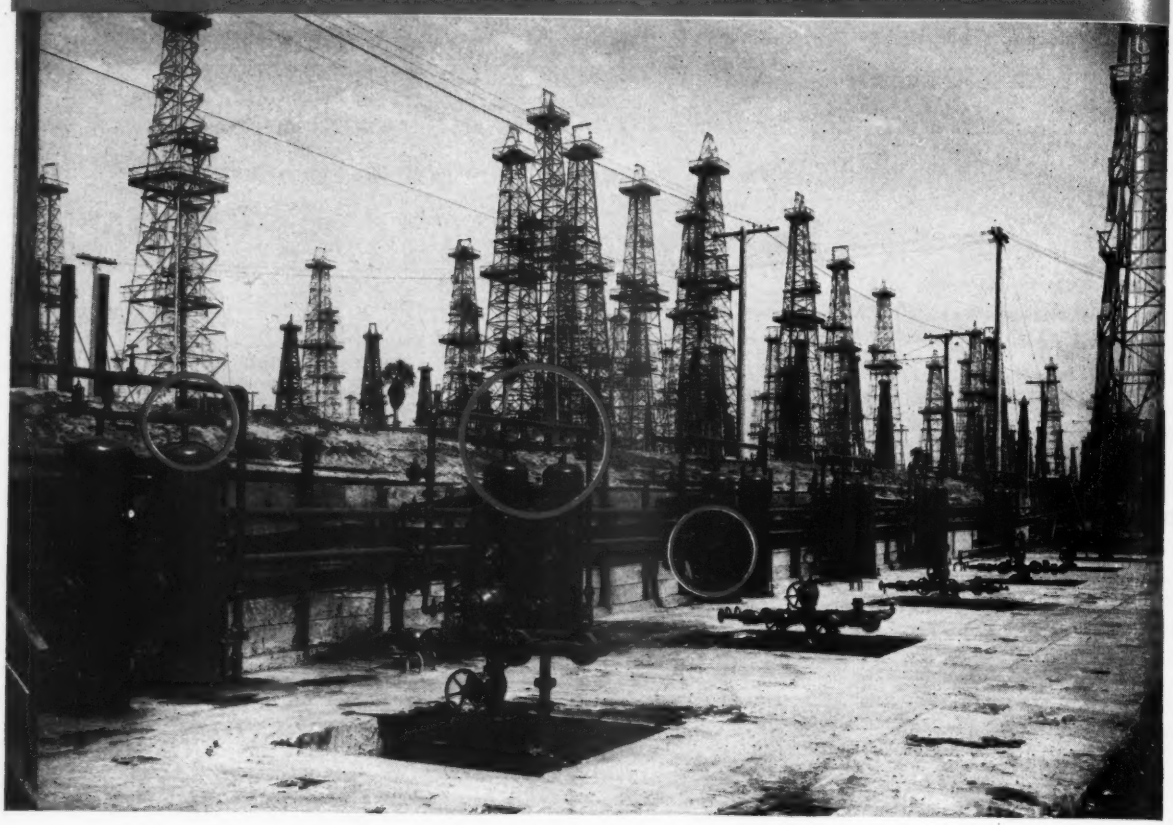
West Coyote Active Area

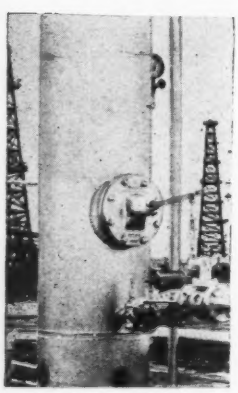
New Standard of California drilling jobs at West Coyote include Emery No. 80 and No. 82 in Sec. 13 and 24-3s-11w. The company also is drilling Murphy-Coyote No. 214 and No. 215 in Sec. 18-3s-10w.



Herley-Kelley Drilling Co.'s well, Orduno No. 7, in the Del Valle Field. Front row, left to right: A. E. Lydick, cat head; L. M. Jones, derrick; rear row, left to right: Irvan Wright, floorman; Paul Lydick, driller; R. H. Newman, floorman.

OIL PRODUCERS RELY ON *RELIANCE* FOR MAXIMUM OUTPUT





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Murphy-Coyote No. 218 in Sec. 19-3s-10w and No. 219 in Sec. 19 have started.

Wilmington Retort Builds

Union Oil Co. moving to enlarge its sources of oil supplies, is increasing the participation of "76" in California's growing synthetic oil program. Under construction is a 50-ton daily retorting pilot plant at the company's refinery at Wilmington. In operation there already is a pilot plant with a shale throughput capacity of two tons daily. Union has developed a new shale retorting process. It uses a new underfeed principle with counter-current flow of shale and air. Many advantages are claimed for the Union method, due to the fact it is continuous and counter-current. Almost perfect heat exchange is attained in the unit, allowing the use of a very short bed.

Rosecrans Try Interests

One of the most interesting tests well in the Los Angeles Basin is Federal Oil Co.'s Barnes No. 1 in Sec. 21-3s-13w, which is just about ready to unravel the full production story at that location.

Drill site is on the 11-acre Leonard Barnes place on the south side of Rosecrans avenue, several hundred feet east of Central avenue. The 25-acre Barnes piece on the other side of Rosecrans avenue also is included in the block, which also takes in the airport and brickyard. Federal has a total of 300 acres in the area under lease.

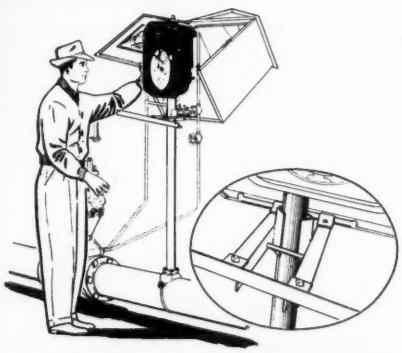
Closest previously established production to the well is about one mile east. Two exploratory holes drilled years ago in the area under interrogation were credited with encouraging showings. These earlier tests were known as Nancy Anthony and Dominguez Extension, respectively. The former was north of Barnes No. 1 and the latter, south. Shell Oil is a holder of substantial acreage in the area. Other holders are Jergins, Superior and Rothschild.

East Coyote Wells Listed

Union Oil Co. is starting Hole No. 3 in Sec. 23-3s-10w in the East Coyote field. Also under way is Hathaway Co.'s Anaheim Union Water Co. No. 25 in Sec. 24-3s-10w. Bartholomae Corp. has added a new well with completion of Stern No. 13-A in Sec. 22-3s-10w. Initial yield was 54 barrels daily of 25.5 gravity oil, cutting 40 per cent.

Richfield Adds Work

Spitfire Oil Co. has begun working Davenport No. 4 in Sec. 28-3s-9w in the Richfield field of Orange County. Zuni Oil Co.'s Zuni No. 1 in the section is pumping about 20 barrels a day from 3375 ft. It was completed a couple of months ago.



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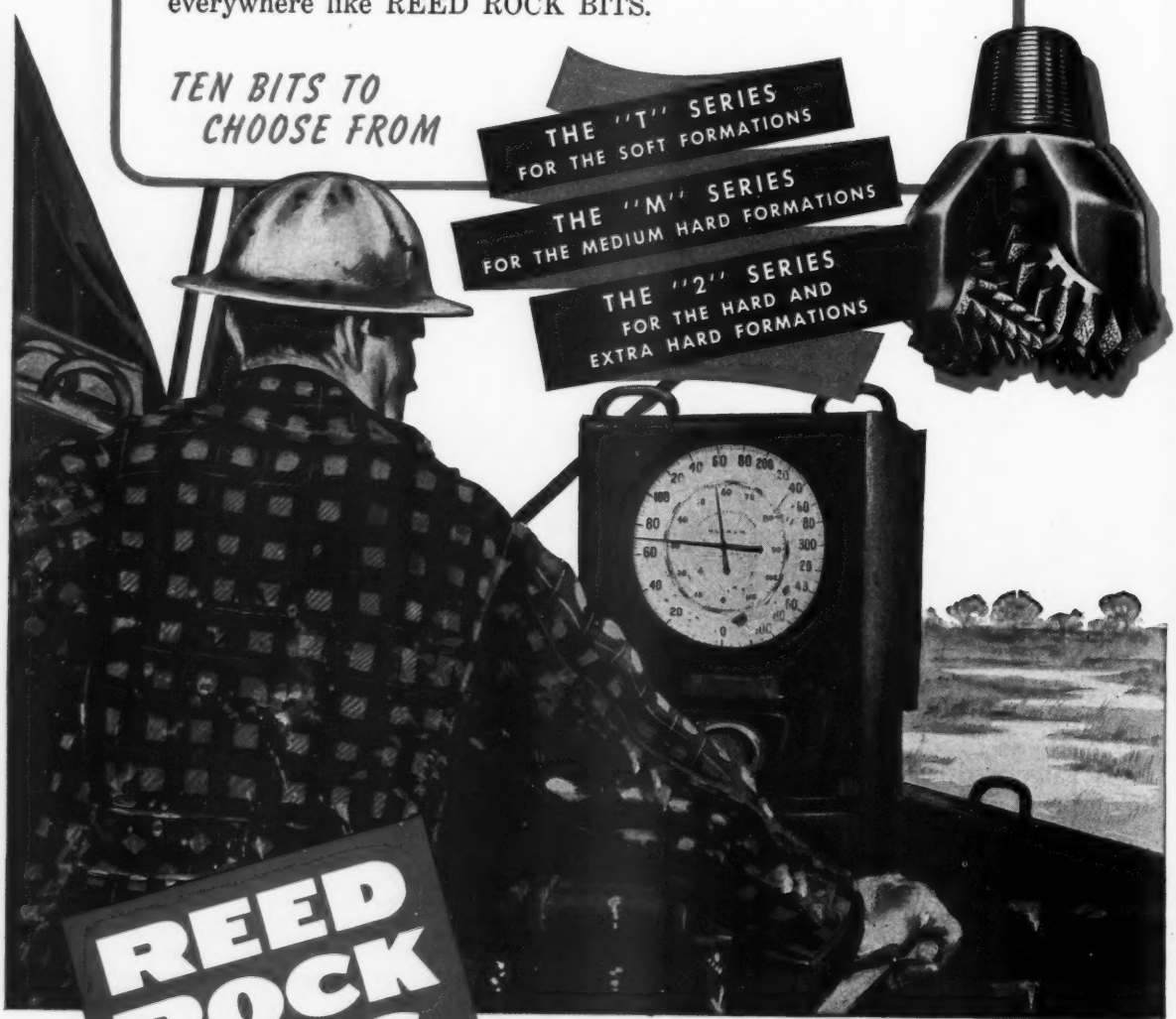

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Coastal and Northern District

Santa Ynez Valley Exploration Listed

The 40,000-acre Lazy R. G. Ranch in Santa Ynez Valley, approximately 30 miles north of Santa Barbara, is in line for an interesting exploratory play.

Fred M. Manning & Associates is sponsor of the drilling program. Manning, owner of a large contract drilling concern in the Rocky Mountain region, is represented in California by his Coastal Drilling Co.

The ranch, a garden spot of California, is yet to feel the inquisitive touch of the prospect drill. Ground some distance westerly of the ranch once was the scene of unsuccessful test drilling conducted by Richfield Oil.

Manning has programmed three test wells for the ranch on a structure delineated by geologists as covering no less than 3000 acres. The area has been the subject of geological studies by leading geologists, including Bradley Adams, Rod Cross and Dean Sheldon.

Production comparable to that developed at Santa Maria is expected in the Santa Ynez drilling program. The Lazy R. G. Ranch is owned by Lewis W. Welch.

Simi Try Starting

On the 1250-acre Marr Ranch in the Simi area, M. H. Marr is getting ready to explore for oil through the medium of Marr Ranch No. 1 in Sec. 30-3n-17w. Prospecting probably will be carried to a minimum depth of 7500 ft. Headquarters of the operator are in Santa Susana.

Visalia Try Begins

In the Visalia area, W.J. Carter is starting work on Carter-Chedster No. 1 wildcat in Sec. 21-18-25. It will be a contract job.

Lompoc Try Grades

Ground is being graded for Union Oil's Crandall Government No. 1 in Sec. 11-7n-33w east of the Lompoc field in Santa Barbara County. The company recently completed Eefson No. 11 in Sec. 33 and Eefson No. 16 in Sec. 28-8n-34w in the Lompoc field. The former was finished at a plugged depth of 2400 ft. for an initial yield of 127 barrels of 21 gravity oil a day, cutting 2.4 per cent. The latter was brought in from 2665 ft. for an output of 37 barrels daily, cutting heavily.

Santa Maria Wells Rework

Midway Oil Co. of Los Angeles has embarked upon a campaign of reconditioning a number of wells in Sec. 8-10n-33w in the Santa Maria field. Union Oil Co. is about to spud its Vincent No. 21 in Sec. 36-10n-33w.

Ventura Avenue Adds New Producer

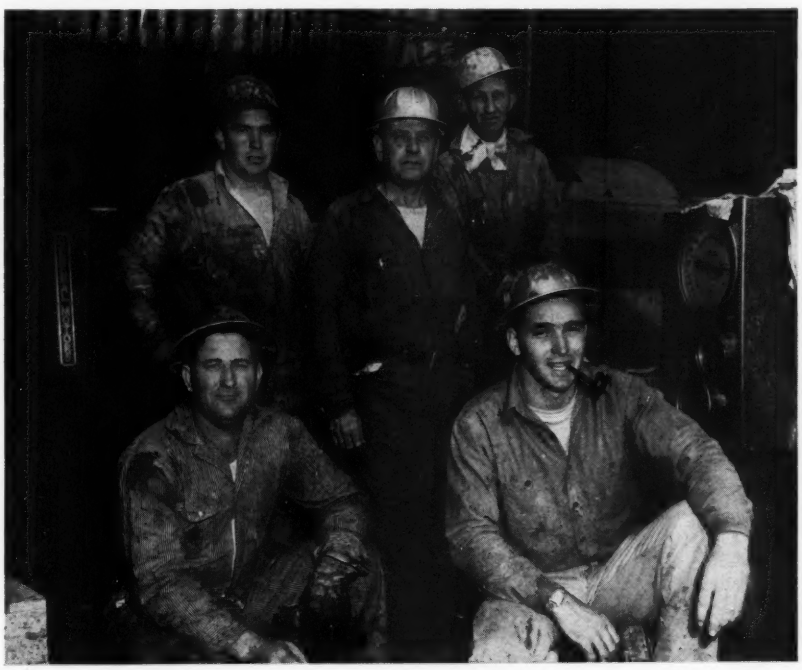
British-American Oil Prod. Co. has completed Hartman No. 14 in the Ventura Avenue field, flowing an estimated 600 barrels from 11,973 ft. Flow is choked back. Bolsa Chica Oil Corp. holds a 40 per cent interest in the 60-acre lease.

Pt. Concepcion Well Abandoned

South of Lompoc on the coast, Independent Exploration's No. 1 on the Sudden Ranch in Sec. 26-6n-36w has called a halt to further operations at that location. The hole went to 2514 ft. primarily as a geological informant. A follow up job probably will be south of the No. 1 and somewhat closer to the shoreline.

Cat Canyon Lease Deal

Union Oil Co. has acquired for approximately $500,000 the old Palmer-Stendahl oil leases in the Cat Canyon area of Santa Barbara County. The company in fee or lease obtains 2477 acres of oil ground and will acquire 1236 acres now under lease to Bishop Oil Co. and 990 acres currently under lease to General Petroleum Corp., with the expiration of those leases. The Palmer-Stendahl properties are



Kern Oil Co.'s Well No. 34-46A in the Race Track Hill Field. Front row, left to right: L. R. McCartney, floorman; A. T. Grafton, derrick; rear row, left to right: Roy M. Dennis, floorman; R. I. Kightlinger, driller; C. M. Dove, cat head.

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among the oldest producing areas in the Santa Barbara County. Union has done much prospect work there.

Guadalupe Test Begins

Continental Oil Co. has started a new exploratory venture on the LeRoy property in the Guadalupe area in San Luis Obispo County, north of Santa Maria. The well, Sand Dune-LeRoy No. 2 in Sec. 2-10n-36w, is one location north of the No. 1, which Continental took over some months ago from Sand Dune Oil Co. Union Oil Co. is a substantial holder of acreage in the area, in addition to Continental.

Rincon Well In

C.C.M.O. Co. has given the finishing touches to Hobson No. B-15 in Sec. 17-3n-24w in the Rincon field for an initial yield of 71 barrels of oil and 145,000 cubic ft. of gas a day from 4660 ft. Cut was 3.5 per cent.

Ojai Job Starting

San Cayetana Oil Co. is starting No. 1 well in Sec. 18-4n-21w in the Ojai area, Ventura County. T. M. Gibson's No. 3 in Sec. 12-4n-22w has reached 112 ft. and is temporarily inactive.

Arroyo Grande Locations Staked

Edwin W. and Harold R. Pauley have location staked for Mutual No. 2 in Sec. 5-32s-13e in the Arroyo Grande-Edna area in San Luis Obispo County. Adams Oil Co., meantime, is commencing Dollie No. 9 in Sec. 6-32s-13e.

Capitan Try Begins

Rothschild Oil Co., well known producing and marketing organization at Santa Fe Springs, is starting Careaga No. 1 test in Sec. 36-5n-31w in the Capitan area, Santa Barbara County.

Conejo Try Idle

In the Conejo area of Ventura County, drilling operations in Ti-Bell Drilling and Roy's Janss No. 1 have come to a temporary halt at 6900 ft. Located in Sec. 33-2n-19w, resumption of drilling is expected to take place in the near future.

San Ardo Adds Well

Texas Co.'s newest well in the San Ardo area, Rosenberg No. 3 in Sec. 34-22s-10e, is showing a current yield of 23 barrels of 10 gravity oil daily, cutting 8 per cent. Plugged depth is 2190 ft. and original bottom is 2478 ft.

Olivera Canyon Wildcat Listed

Waiting on contractors tools was the latest report from Pacific Western's Williams Holdings No. 1 in Sec. 18-9n-32w in the Olivera Canyon area, Santa Barbara County.

Shiells Canyon Drilling Scene

Texas Co. has two drilling jobs under way in the Shiells Canyon field. They are Shiells No. 162 in Sec. 9 and No. 163 in Sec. 4-3n-19w. Both are still above objective depths.

Stockton Try Planned

Near Stockton in San Joaquin County, Amerada Petroleum Corp. is engaged in preliminaries leading to the drilling of of Martenet No. 25-2 wildcat in Sec. 2-2n-8e.

Rio Vista Well Starts

D. D. Feldman has begun work on Gardiner No. 1 well in Sec. 35-4n-3e in the Rio Vista gas field. Feldman in recent months has been prominently identified with oil development in Ventura County.

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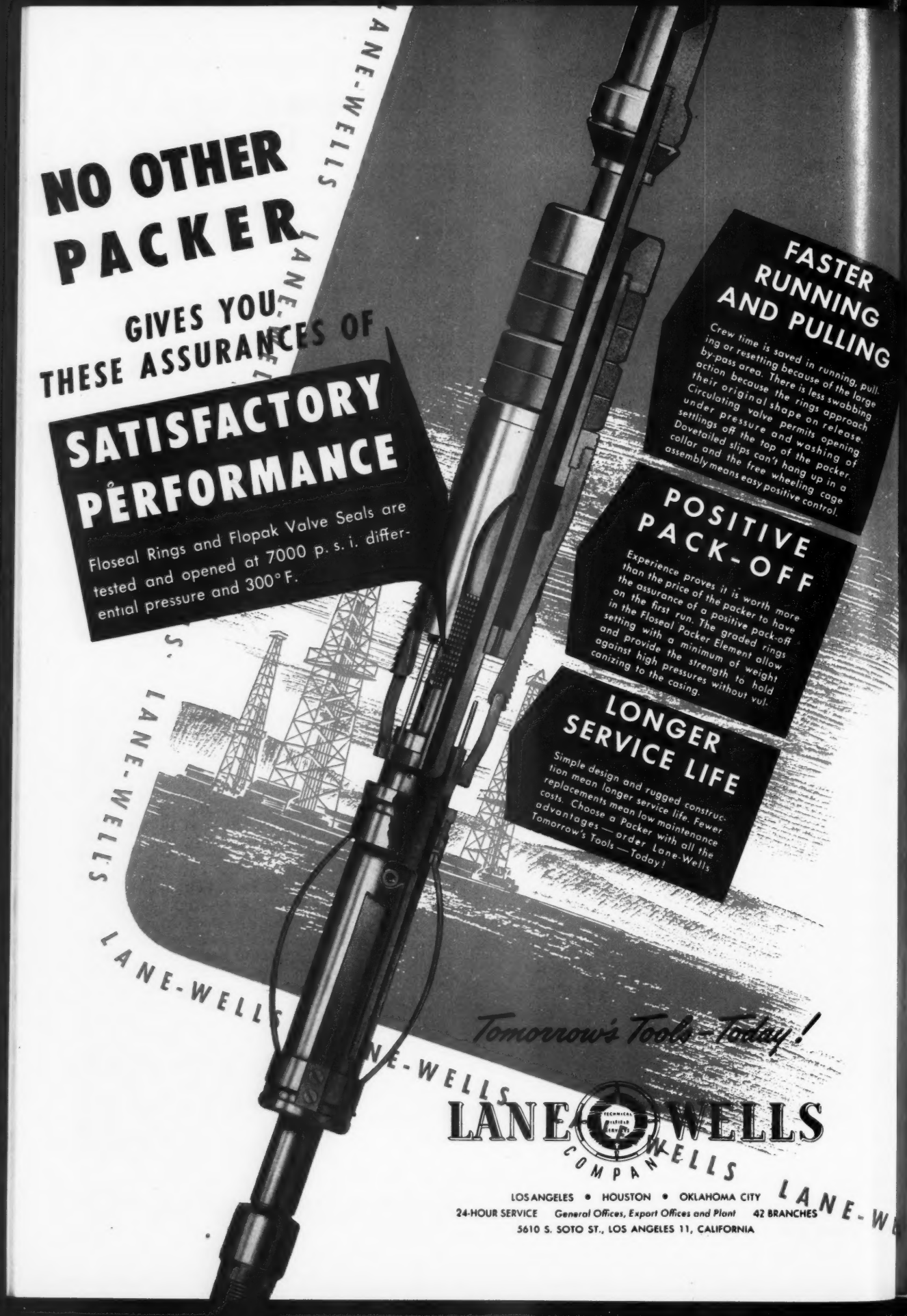
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San Joaquin Valley

Painted Rock Leasing Scene

Texas Co. has added interest to the Painted Rock Anticline area by leasing approximately 7000 acres there. The ground in question borders Carizzo Plains, about 10 miles north of the Cuyama Valley discovery well. The lease is understood as having been obtained through A. H. Heller and Guy L. Goodwin.

Kettleman Hills Drilling Planned

The staking of a new well location by Standard of California and Bolsa Chica Oil Corp. in the Kettleman Hills Middle Dome area is about to take place. This move will mark a resumption of development work in the area, which was the scene of an Eocene discovery some months ago.

Comanche Point Wells Beginning

Fred A. Miller is beginning work on a new drilling job in Sec. 25-12n-19w in the Comanche Point area of Kern County. Sierra Oil Co. has made location for Sierra No. 1 test in Sec. 32-12n-18w.

Belridge Field Well Programmed

Holly Development Co. has announced that it has under consideration the drilling of a shallow well on the company-owned lease west of the Belridge field. Small production has been developed near the property at a depth approximating 1000 ft.

Holly also expects to start another well shortly on its Stanchos lease in Dewitt County, Tex., according to a letter to stockholders. The company's Stanchos No. 1 is producing at the rate of 165 barrels daily through a 7/64-in. choke, an allowable fixed by the state. Original flow was 35 gravity clean oil through an 8/64-in. bean, in excess of allowable output prescribed by Texas authorities.

Structurally, the Stanchos lease evidently is well located in the field. This is confirmed by information gained from two wells drilled on offsetting acreage. These wells are one location south and east of the No. 1.

Cuyama Try Quits

Navy Oil Co. has given up its Kirschenmann No. 1 test in Sec. 12-10n-27w in the Cuyama Valley area. Abandonment was brought about largely by mechanical troubles. The project was credited with oil sand from 4980 to 5030 ft. in going to a total depth of 5127 ft. The company is planning another hole on the same lease.

Kern River Wells Listed

Steele Petroleum Co. has been organized primarily to acquire and operate the interests of the firm of Beatty & Steele. Additional wells are planned for the Kern River field.

Headquarters of Steele Petroleum are in Phoenix, Ariz., with L. R. Jacobson of Los Angeles, California agent.

Mount Poso Test Idling

In the Mount Poso area, J. G. Leland's test well in Sec. 6-27s-29e is standing idle at 250 ft. The project is called Jane No. 1.

Raisin City Well Staked

E. W. Pauley is commencing another well on his Hamilton lease in the Raisin City field. Tagged No. 32-13, it will drill in Sec. 13-15s-17e, northwest of Hamilton No. 43-13, which was completed two years ago at 5115 ft. Present yield of the latter is about 65 barrels of net oil a day.

San Emigdio Wildcat Quits

Continental Oil Co. has abandoned Santiago No. 1 in Sec. 8-11n-22w in the San Emigdio area, Kern County. The venture went to 9920 ft., ran electric log and quit.

Kern River Try Starts

Elmer C. von Glahn has staked a location for KCL-Canal No. 2 in

In the Coles Levee Field at Richfield Oil Corp.'s well No. 74-28. Front row: David Hallmark, rotary helper; rear row, left to right: Joe Mann, derrick; Roscoe Haskins, derrick; R. F. Walt, driller; John D. Franklin, cat head.

Sec. 8-29s-28e in the Kern River area. His KCL-Canal No. 1 in the section was recently abandoned at 1640 ft.

McKittrick Test Staked

East of the McKittrick field, Signal Oil & Gas Co. is starting work on Signal-Pike No. 1 wildcat test in Sec. 10-30s-22e.

Mountain View Redrilling Job

Getting ready to redrill Canfield No. 1 in the Mountain View field is J. L. Listle, well known San Joaquin operator. Location is in Sec. 12-30s-28e.

Wheeler Ridge Wildcat Digs

Richfield Oil Corp, has spudded its Wheeler Ridge-KCL No. C-2 exploratory hole in Sec. 29-11n-20w in the Wheeler Ridge area. Tejon B No. 65-34 in Sec. 34-11n-19w in the Tejon area is about to spud, as is Russell No. 1 in Sec. 5-10n-27w in Cuyama Valley. The company is reported to have blocked up more acreage in Cuyama Valley than the total holdings of all other operating organizations there.

Devils Den Well Pumps

S. R. DeKalb has finished Blake No. 16 test in Sec. 25-25s-18e in the Devils Den area at 1305 ft., pumping to sump an estimated yield.

Arvin Try Idle

Louis H. Didier's Didier No. 1 wildcat in Sec. 10-31s-30e in the Arvin area is idle at 2350 ft. in granite. Bolsa Chica Oil is planning to start a well shortly in the area on Di Giorgio Ranch.

Cantua Creek Wildcat Slated

Location has been staked by Pacific Western Oil Corp. for its White No. B-65 wildcat in Sec. 11-16s-14w near Cantua Creek, Fresno County.

Jasmine Try Staked

Quinn Ranch Oil Co. is ready to start work on another test in the Jasmine area, Kern County. The new well, Quinn Ranch No. 1, is in Sec. 15-25s-27e.

Semitropic Try Starts

Standard of California has location staked for Towle Estate No. 4 in Sec. 7-27s-23e in the Semitropic area, Kern County. It is on wildcat ground.

Canoga Park Well Pumping

In the Canoga Park area of Los Angeles County, Vincent F. Stabeck has completed Knapp No. 4 in Sec. 14-1n-17w at 790 ft. pumping an unestimated yield.

Ramona Area Job Slated

Jack Herley and Paul L. Kelley have made location for Orduno No. 8 in Sec. 18-4n-17w in the Ramona area. The combination already has 14 wells producing in the area.

Castaic Try Idle

L. R. Wilhite and Claude Kavanaugh's Wilhite-Jenkins No. 1 wildcat test in Sec 18-5n-16w near Castaic at last reports was idle temporarily at 1965 ft.

Sunset Beach Project Ready

Standard of California is moving ahead with its Lomita Land & Water Co. No. 3-1 exploratory venture in Sec. 19-5s-11w at Sunset Beach, Orange County.

Newhall-Potrero Venture Deeper

General Exploration Co. is drilling steadily ahead below 4000 ft. with its Ferguson No. 1 in Sec. 36-4n-17w in the Newhall-Potrero area.

Bacon Hills Try Working

Roads and water lines are in and Western Gulf Oil Co. is now rigging its Spencer A-U.S. No. 18-34 wildcat in Sec. 34-28s-29e in the Bacon Hills area. The company will endeavor to duplicate production uncovered in the area by Seaboard Oil Co.

In the Paloma Field, Herb Whiston, contractor for Western Gulf Co. well. Left to right: E. A. Murphy, truck driver; R. Bumgarner, floorman; L. V. Hansen, driller; Morris Dixon, floorman; Walter Bumgarner, derrick.

Axelson Purchases Rights to Vernon-Suter Hydraulic Pump Jack

Mr. J. C. Axelson, president of the Axelson Manufacturing Company, has announced that his firm has just purchased exclusive manufacturing and sales rights to the pumping unit which has established such a remarkable service reputation on the West Coast under the name "Vernon-Suter Hydraulic Pump Jack." In the future, this unit will be manufactured, marketed and serviced under the Axelson name.

Mr. Axelson states that his company "has furnished polished rods, sucker rods and pumps for many installations of these units, and has watched with growing amazement the freedom from rod breakage shown by the performance records. Equally impressive is pump life and increased production."

The Axelson Hydraulic Pump Jack is adaptable to polished rod loads up to 32,000 lbs. and strokes of 25 feet or longer. It features a constant load on the rods with soft, cushioned reversals and ability to pump from unusual depths without rod failures. The jack operates on a low pressure cycle, is easily portable and simple to understand and service. Another outstanding feature is the extreme ease with which this unit permits spacing the well.

For additional information, write Axelson Manufacturing Company, Box 98, Vernon Station, Los Angeles 11, California.

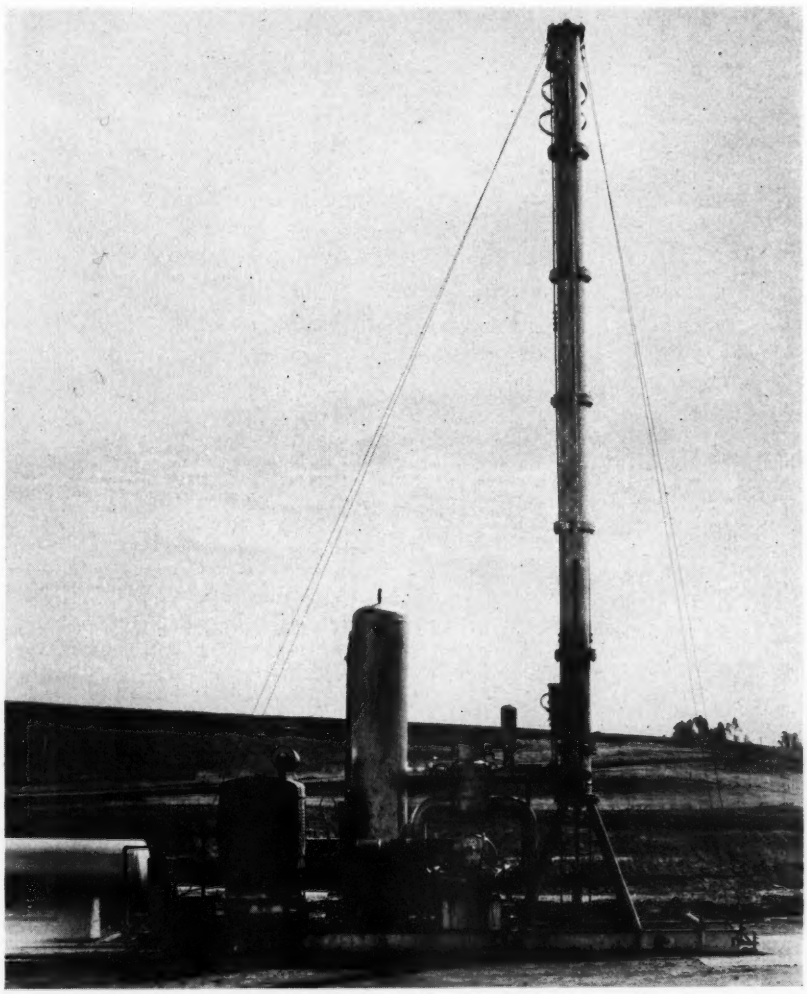
The purchase, by Axelson, of the manufacturing and sales rights to the hydraulic long stroke unit only, will in no way affect the normal operation of the Vernon Tool Company, Ltd. Vernon will continue to manufacture and supply to the petroleum trade such items as centrifugal de-sanders, vibrating mud screens, centrifugal pumps and Western engines as well as other production equipment and general oil field machine work.

McCullough Introduces New Weight Indicator

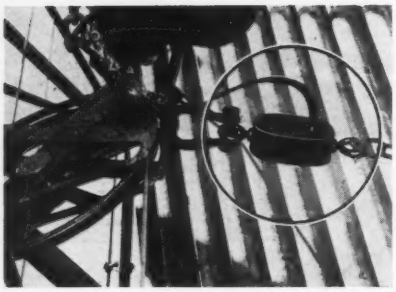
A new, supersensitive electronic weight indicator that accurately indicates any minute variation in weight, has been announced by the McCullough Tool Company of Los Angeles.

According to the manufacturer, this new weight indicator, through the application of electronics, represents a radical departure from former methods, making possible the elimination of all wearing parts, the utilization of a smaller and lighter derrick unit and enabling the indicator to detect and locate with a high degree of accuracy, the following:

1. Fluid level
2. Collars
3. Tight places in pipe
4. Liner tops
5. Well bottoms
6. Or any obstruction that may be in the hole



Vernon-Suter hydraulic pump jack, shown above in operation in Southern California, will now be manufactured, sold and serviced by Axelson Manufacturing Company, under the name Axelson Hydraulic Long Stroke Pump Jack.



Smaller and lighter derrick unit made possible through the application of electronics in the new McCullough weight indicator.

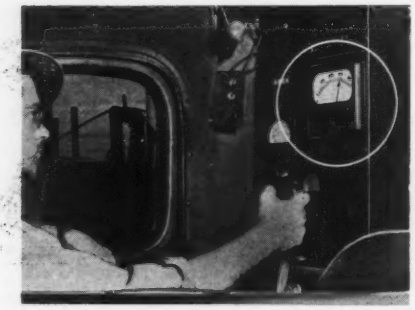
Its supersensitivity also makes it invaluable when used in combination with the McCullough gun perforator, Magna-Tector, collar locator or gun tester, pressure bomb and surface recorder combination.

By attaching collar finder fingers to any tool that is run on a wire line and using the electronic weight indicator in combination with the McCullough sonic unit, the operator is provided with visible as well as sound indication of any variation in weight or speed of travel, permitting a twofold check of well conditions.

The construction of the McCullough supersensitive electronic weight indicator is very simple; there are no wearing parts whatsoever. The derrick unit is made of the finest alloyed steels and is strong enough to operate safely on the deepest wells and under the most severe conditions without danger of trouble. wear or breakage.

The device operates in the following manner:

When run in combination with the McCullough gun perforators, Magna-Tector, Collar locator, bridging plug, or surface recording bottom hole pressure bomb and gun tester combination, the weight indicator is placed between the bail of the derrick sheave and one of the tie back chains, as shown in the illustration. An electric conductor cable connects the derrick unit of the weight indicator to the meter in the service truck where the most minute variation of weight is visibly transmitted to the operator.



Minute variations in weight are indicated on the control panel of the McCullough Service Truck, giving the operator a constant, visible check of well conditions.

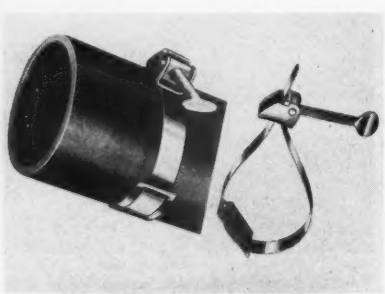
The McCullough supersensitive electronic weight indicator is another valuable addition to the McCullough service units and provides the customer with extremely accurate information at no added cost.

This device can be used in combination with any wire line operation such as bailing, swabbing or collar locating. It can be provided for purposes other than use with the McCullough service unit. For export there is a special set-up consisting of a derrick unit, conductor cable, and indicator gauge or meter which will function equally well with or without the McCullough service unit.

Full information on its use and availability may be obtained from the McCullough Tol Company, 5820 S. Alameda Street, Los Angeles, California.

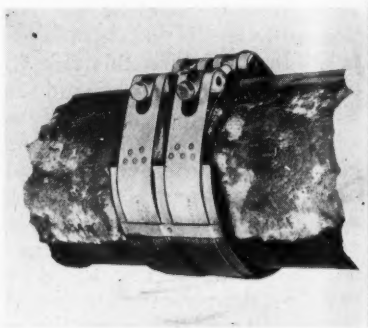
Marman Clamps Proving Success in Operations

Both high and low pressure pipe line leaks are now fixed with a minimum of time and cost by the use of lightweight adjustable clamps, made by Marman Products of Inglewood, California. Many of the repairs are now made on discovery, by field superintendents or lease foremen, instead of requiring repair crews. This is possible because the new type clamps fit varying diameters of pipe, and a supply can be carried in the cars of these field men. One man can quickly install a clamp on practically any line, without help.



Patchmaster Clamp

At Honolulu Oil Corporation's lease in the Midway Sunset area at Taft, Foreman Jim Shelton reports substantial savings in time and cost from the use of lightweight stainless steel clamps. Because a few sizes are adjustable to fit many diameters, and work equally well on misshapen or corroded pipe, only a relatively small stock is required. These are carried in field men's cars without too much weight or bulk and are immediately available when a leak is discovered. A majority of leaks on the Honolulu Oil lease are repaired without calling a crew.

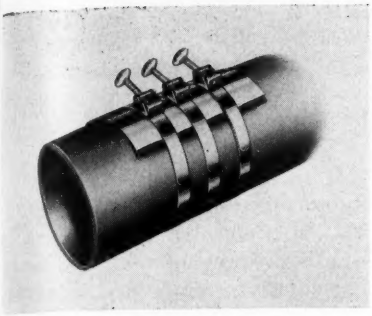


Hi-Pressure Clamp

Because a large percentage of leaks can be fixed on discovery, oil companies give these modern clamps credit for increased safety as well as economy. There is a saving in oil and gas resulting from prompt repairs, as well as in labor cost.

This new type of Marman pipe clamp has been developed by men with oil field experience and the clamps are being successfully used on oil, gas and water lines. There are specific models for different sizes and types of application, from low to extremely high pressures. Small leaks are fixed with least expensive clamps and larger repairs use adjustable or fixed diameter models as required.

California oil companies report applications of Marman clamps in one-quarter to one-half the usual time. Small leaks have been stopped as quickly as 30 seconds. Regardless of the location of the leak, the clamp can be moved around to the most convenient position, and can be quickly installed without tools.



Low-Pressure Clamp

The use of stainless steel has also been important in preventing electrolytic action that would cause corrosion. The pad itself is resistant to oil and gas and is attached to the clamp so it can never be blown out by pressure.

Marman clamps of all types will be on exhibit at the forth coming Tulsa Petroleum Show.

New Portable Mast for Deep Drilling Operations

Emsco Derrick & Equipment Company of Los Angeles, California and Houston, Texas, announces the development of a new bulge type portable mast for deep drilling. Designated as the 18P mast, this new unit incorporates all of the proven design features of the Company's line of bulge portable masts. A special feature of this new mast is that it may be equipped with either one or two bulges. The double bulge construction is especially advantageous when the mast is barge-mounted for workover operations on water locations. It permits the simultaneous racking of both drill pipe and tubing.

The 136 foot height and the crown block capacity of 800,000 lbs. make the 18P portable most comparable to standard A.P.I. derricks that have been used for drilling to depths in excess of 15,000 feet. Unlike conventional masts which are open on the "V" side, the Emsco bulge type portable mast permits adequate supporting of all four legs by exterior bracing thereby eliminating the need for interior stiffening members.

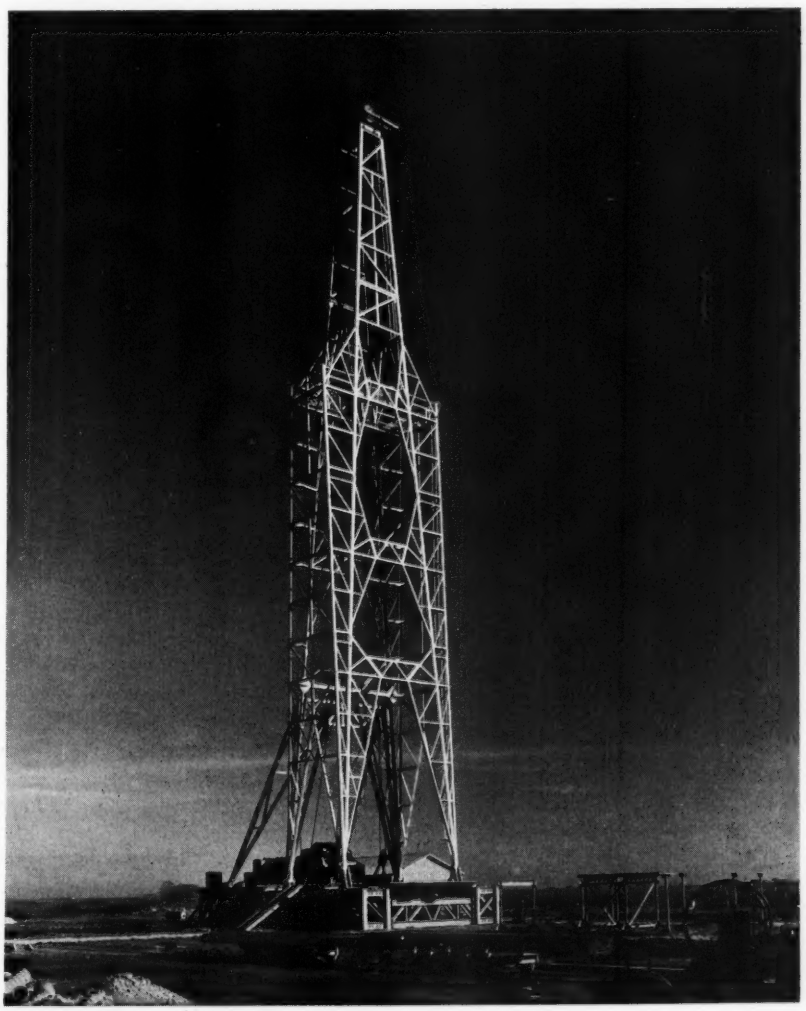
This design allows the mast to be rated by the same conservative standards established by the A.P.I. for standard derricks. Welded connections provide greater strength and less vibration than is encountered in standard drilling derricks. The 18P portable mast is designed to withstand 70 mile per hour wind with a full setback of pipe standing in the bulge. No guying is necessary.

Another outstanding feature of the new Emsco 18P portable mast is the amount of racking space available. The base dimensions of 16 feet by 26 feet are sufficient to accommodate the largest draw works. The 26 foot base dimension carries up vertically to the working platform. This provides 70% greater width, at this height, than is available in the standard 30 foot base derrick, and, according to the manufacturer, affords approximately twice the effective space found in any mast previously available. 192 stands of 4½" O.D. drill pipe may be racked in a single bulge while holding the inside stands five feet from the center of the well.

Whittier Try Works

Bert Branch is rigging up to start the drill in his No. 1 project in Sec. 34-2s-11w in the West Whittier area.

National Petroleum Council's estimates of the petroleum industry's annual steel requirement of 10,381,000 tons for the next few years is based on demand for oil growing from 6,250,000 barrels daily this year to 6,800,000 barrels a day by 1950. The estimates do not take into account requirements for casting and forgings.



Emsco Derrick & Equipment Company new portable mast for deep drilling operations.

The Petroleum Industry of California

(Continued from Page 20)

western petroleum companies because this is distinctly a radical departure from the normal processes of the oil industry. However, as has been brought out, it all came about in a perfectly normal way, and there can be little doubt of its importance to the national economy—in fact to the world economy. Just as the countries of the world can no longer remain independent and apart from each other, so it is true that the various industries by and large can not isolate themselves from the total industrial picture. The oil industry has in the most normal way become more and more helpful to other industries, and in the expansion of these interests, here in California at least, has arisen whole new spheres of enterprise. Agriculture is not, of course, the only industry in which petroleum has become especially and inextricably involved. There are many others, but this is sufficient to show the trend.

Returning now to the more closely related type of research, we find that in recent years, the problems of the geologist, driller and producer have become in themselves so substantially developed by increasing knowledge of the principles involved, that the larger California companies have been obliged to set up separate institutions, specially equipped and specially manned for this type of study. As the demand for oil climbs higher and higher, it becomes necessary to utilize every vestige of scientific know how to improve the effectiveness of our finding and producing devices and techniques; and increase to the maximum the available petroleum recovery. With 1200 useful commodities and compounds already being manufactured from petroleum and new ones being found daily, it seems fairly obvious that the demand is not going to drop back. At the same time with the multitude of agencies and devices already applied to the finding and producing of oil, it becomes more difficult and more costly every minute to find new sources. It is for this reason that western operators have really gone into exploration and production research in a big way.

These activities are carried on in the most modern quarters thoroughly air-conditioned so as to protect the health of the personnel and at the same time prevent interference with the functioning of delicate laboratory instruments and tests. The general plan is of wide scope and covers every phase of exploration and exploitation, utilizing the combination of physical, chemical and geological sciences in the attack. It seeks not only to improve existing methods in all departments of production, but simultaneously to develop the fundamental knowledge which is necessary to the institution of new methods of approach. Needless to say, such laboratories work at all times in the closest cooperation with the field, and are ready at a minutes notice to tackle any new problem that should arise—when it lies within the scope and province of the laboratory. To facilitate this cooperative endeavor, it is common to have instrument trucks of various types, equipped to carry out tests right on the ground where such expedition is desirable.

The investigations include the mechanism of reservoir flow, and all the diversity of factors that exert their influences — bottomhole pressure, permeability, porosity. Physicists apply themselves to studies of the earth's gravitational magnetic, and electric fields, and try to correlate these findings with the presence of oil. They investigate the character of rocks with penetrating neutrons and gamma rays, disclosing their composition and content. Drilling operations are simulated under laboratory conditions and observations are made on all the ramified phases of the process. Hole surveying, and the instruments employed, are constantly being investigated and improved by all the abstruse arts that the physicist can summon—a long cry from the old acid bottle that started this type of activity. Earth movements come in for lots of attention, and the seismograph is helping to resolve the difficulties of a very complex study. One of the things that makes it most difficult is that the factors under consideration exert themselves down in the bowels of the earth, but of necessity they must be tackled on the surface.

With the use of drilling muds in the rotary system, the colloid chemist came into the picture, and is now devoting his time to the development of the most efficacious types of fluids for a variety of purposes, and at the same time is studying the mechanics of action, and the physico-chemical characteristics of the various types of rocks and formations that are encountered by the drills. Geo-chemists seek to find by analysis of surface gases the small escapements of hydrocarbon gases that might be indicative of oil below. All of these activities, of course, are closely coordinated, and are doing an excellent job of keeping California petroleum where it has always been, in the forefront of the production picture. The entire program is aided by close consultation with geological department representatives, field petroleum engineers, superintendents, and others familiar with the present status of tools, techniques and processes.

In addition to the research projects already described, some word perhaps should be mentioned of the pilot plants and of the whole program of development — that intermediate step between the laboratory and the ultimate commercialization of the acceptable idea. It might be revealed that there have recently been established in Montebello, California, a new research center and pilot plant for developing methods of synthesizing products from various sources of supply. Already operating at this point are semi-commercial size pilot plants, capable of producing some 5000 gallons of synthetic gasoline a day. Work is now under way on the conversion of heavy fuel oils and of various types of coal to synthetic fuel. It is stated that the method employed in this plant bears little resemblance to the old Fischer-Tropsch process. As a result of greatly increased throughputs, cheaper and better catalysts and improved conversions and